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DOE/MA-0064/4
Volume 1 of 7

Congressional Budget Request

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Atomic Energy Defense Activities

Volume 1

FY 1987

U.S. Department of Energy
Assistant Secretary,
Management and Administration
Office of the Controller

February 1986

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DOE/MA-0064/4
Volume 1 of 7

Congressional Budget Request

Atomic Energy Defense Activities

Volume 1

FY 1987

U.S. Department of Energy
Assistant Secretary,
Management and Administration
Office of the Controller
Washington, D.C. 20585

February 1986

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DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

ATOMIC ENERGY DEFENSE ACTIVITIES

VOLUME 1

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DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

(in thousands of dollars)

	FY 1985 Actual BA	FY 1986 Estimate BA	FY 1987 Request BA
Appropriations Before The Energy and Water Development Subcommittees:			
Energy Supply Research and Development	1,967,490	1,696,298	1,254,162
Uranium Enrichment	237,956	190,512	---
General Science and Research	724,860	655,928	773,400
Atomic Energy Defense Activities ..	7,322,321	7,231,664	8,230,000
Departmental Administration	128,602	150,319	151,082
Alaska Power Administration	3,233	3,245	2,881
Bonneville Power Administration ...	284,771	330,000	276,100
Southeastern Power Administration .	35,744	---	19,647
Southwestern Power Administration .	31,208	29,191	25,337
Western Area Power Administration .	218,230	195,910	240,309
Western Area Power Emergency Fund .	---	---	---
Federal Energy Regulatory Commission	54,543	41,989	20,325
Nuclear Waste Fund	327,669	499,037	769,349
Geothermal Resources Development Fund	121	69	72
Subtotal, Appropriations Before the Energy and Water Development Subcommittees	$11,336,748	$11,024,162	$11,762,664

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

(in thousands of dollars)

	FY 1985 Actual BA	FY 1986 Estimate BA	FY 1987 Request BA
Appropriations Before Interior and Related Agencies Subcommittees:			
Alternative Fuels Production	$ 1,169,895	$ ---	$ ---
Clean Coal Technology	---	---	---
Fossil Energy Research and Development	289,048	311,954	82,767
Naval Petroleum and Oil Shale Reserves	156,874	13,002	127,108
Energy Conservation	457,436	427,512	39,433
Energy Regulation	27,139	23,423	21,850
Emergency Preparedness	6,045	5,750	6,044
Strategic Petroleum Reserve	2,049,550	107,533	---
Energy Information Activities	60,919	57,724	59,651
Subtotal, Interior and Related Agencies Subcommittees	4,216,906	946,898	336,853
Subtotal, Energy and Water Development Subcommittees	11,336,748	11,024,162	11,762,664
Subtotal, Department of Energy	15,553,654	11,971,060	12,099,517
Permanent - Indefinite Appropriations:			
Payments to States	1,052	570	570
Total, Department of Energy	$15,554,706	$11,971,630	$12,100,087

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL STAFFING REQUEST
TOTAL WORK FORCE

	FY1985 FTE USAGE	FY1986 CONGR REQ	FY1987 -FY86	FY1987 CONGR REQ
ENERGY & WATER SUBCOMMITTEE				
HEADQUARTERS	4,865	4,965	-18	4,947
FIELD	9,133	9,185	111	9,296
SUBCOMMITTEE TOTAL	13,998	14,150	93	14,243
INTERIOR SUBCOMMITTEE				
HEADQUARTERS	1,353	1,304	-166	1,138
FIELD	907	896	-226	670
SUBCOMMITTEE TOTAL	2,260	2,200	-392	1,808
GRAND TOTAL	16,258	16,350	-299	16,051
ADJUSTMENT		-132	-198	-330
ADJUSTED TOTAL	16,258	16,218	-497	15,721

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL STAFFING REQUEST
TOTAL WORK FORCE

	FY1985 FTE USAGE	FY1986 CONGR REQ	FY1987 -FY86	FY1987 CONGR REQ
10:ENERGY SUPPLY RESEARCH AND DEV	937	934	-34	900
HEADQUARTERS	811	820	-28	792
FIELD	126	114	-6	108
15:URANIUM ENRICHMENT	69	66	1	67
HEADQUARTERS	58	55	1	56
FIELD	11	11	0	11
20:GENERAL SCIENCE AND RESEARCH	37	39	0	39
HEADQUARTERS	37	39	0	39
25:ATOMIC ENERGY DEFENSE ACTIVITI	2,618	2,702	131	2,833
HEADQUARTERS	496	518	9	527
FIELD	2,122	2,184	122	2,306
30:DEPARTMENTAL ADMINISTRATION	3,307	3,332	-5	3,327
HEADQUARTERS	1,721	1,726	0	1,726
FIELD	1,586	1,606	-5	1,601
34:ALASKA POWER ADMINISTRATION	37	38	0	38
FIELD	37	38	0	38
36:BONNEVILLE POWER ADMIN	3,510	3,480	0	3,480
FIELD	3,510	3,480	0	3,480
38:SOUTHEASTERN POWER ADMIN	38	40	0	40
FIELD	38	40	0	40
42:SOUTHWESTERN POWER ADMIN	186	186	0	186
FIELD	186	186	0	186
46:WESTERN AREA POWER ADMIN	1,181	1,160	0	1,160
FIELD	1,181	1,160	0	1,160
50:WAPA - COLORADO RIVER BASIN	219	219	0	219
FIELD	219	219	0	219
52:FEDERAL ENERGY REGULATORY COMM	1,617	1,659	0	1,659
HEADQUARTERS	1,617	1,659	0	1,659
54:NUCLEAR WASTE FUND	238	292	0	292
HEADQUARTERS	123	147	0	147
FIELD	115	145	0	145
56:GEOTHERMAL RESOURCES DEV FUND	2	1	0	1
HEADQUARTERS	2	1	0	1
65:FOSSIL ENERGY RESEARCH AND DEV	714	700	-161	539
HEADQUARTERS	151	135	-26	109
FIELD	563	565	-135	430
70:NAVAL PETROL & OIL SHALE RES	104	104	-9	95
HEADQUARTERS	23	23	0	23
FIELD	81	81	-9	72
75:ENERGY CONSERVATION	333	352	-134	218
HEADQUARTERS	208	227	-79	148
FIELD	125	125	-55	70
80:EMERGENCY PREPAREDNESS	74	71	0	71
HEADQUARTERS	74	71	0	71
81:ECONOMIC REGULATION	377	340	-50	290
HEADQUARTERS	377	340	-50	290
85:STRATEGIC PETROLEUM RESERVE	178	152	-32	120
HEADQUARTERS	40	27	-5	22
FIELD	138	125	-27	98
90:ENERGY INFORMATION ACTIVITIES	480	481	-6	475
HEADQUARTERS	480	481	-6	475
94:ADVANCES FOR CO-OP WORK	2	2	0	2
FIELD	2	2	0	2
GRAND TOTAL	16,258	16,350	-299	16,051
ADJUSTMENT		-132	-198	-330
ADJUSTED TOTAL	16,258	16,218	-497	15,721

DEPARTMENT OF ENERGY

Proposed Appropriation Language

Atomic Energy Defense Activities

For expenses of the Department of Energy activities including the purchase, construction and acquisition of plant and capital equipment and other expenses incidental thereto necessary for atomic energy defense activities in carrying out the purposes of the Department of Energy Organization Act (Public Law 95-91), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion; purchase of passenger motor vehicles (not to exceed [435] 344 of which [274] 320 are for replacement only) including [57] 36 police-type vehicles; and purchase of [three] five aircraft, [one] three of which [is] are for replacement only, [$7,604,615,000] $8,230,000,000, to remain available until expended. (Public Law 99-141, making appropriations for energy and water development, 1986.)

Explanation of Change

The Department's request for additional and replacement motor vehicles (24 and 320 respectively) in FY 1987 is significantly less than in FY 1986, a year which saw increased safeguards, security and waste management needs, but reflects a more typical annual procurement request.

The Department is also requesting purchase of five additional aircraft in FY 1987. One rotary wing aircraft will be used to replace a similar craft destroyed in an accident. Four fixed wing aircraft, two new and two that are intended to replace aging fixed wing aircraft, are also being requested for FY 1987.

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

ATOMIC ENERGY DEFENSE ACTIVITIES

(Budget Authority in thousands of Dollars)

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Request
Research, Development and Testing	$ 1,790,037	$ 1,705,899	$ 2,077,400
Inertial Confinement Fusion	25,097	23,868	23,800
Production and Surveillance	2,311,671	2,285,953	2,502,204
Program Direction - Weapons	57,534	95,100	60,550
Verification and Control Technology .	76,637	94,301	101,700
Materials Production	1,745,335	1,768,149	2,066,146
Defense Waste and By-Products Management	727,746	618,424	704,400
Nuclear Safeguards and Security	60,014	57,053	66,900
Security Investigations	34,000	32,200	33,300
Naval Reactors Development	495,300	535,693	593,600
Subtotal, Atomic Energy	7,323,371	7,216,640	8,230,000
Addback of G-R-H Reduction Against Balances	---	7,157	---
Less Use of Prior Year Balances and Other Adjustments	---	7,867	---
Unobligated Balances Brought Forward	---	---	---
Savings from FY 84 Initiatives	-1,050	---	---
Total, Atomic Energy Defense Activities	$7,322,321	$7,231,664	$8,230,000

FY 1987 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW
Atomic Energy Defense Activities

The Department's Atomic Energy Defense Activities include eight programs. The goal of these programs is to accomplish research and development, testing, production and life-time surveillance of safe and reliable nuclear weapons to meet national defense needs, and develop naval nuclear propulsion. The eight programs are summarized below.

Weapons Activities

This program provides for the research, development, engineering, testing, and production of all U.S. nuclear weapons; maintenance of reliable weapons for their stockpile life; retirement and disposal of nuclear weapons from the stockpile; and the program support function that includes community assistance payments and salaries and related expenses of federal employees who manage and administer program activities. In FY 1987, the weapons program will continue to provide new technology to maintain a modern nuclear force, along with the design and development of new weapon systems in response to defense requirements. Increases are provided for continued production of weapon systems.

In FY 1987, the research, development, and testing effort will continue to explore and provide technologies necessary to maintain the U.S. nuclear forces and design and develop new weapon systems in response to defense requirements. Major objectives in the research, development, and testing area include maintaining the capability to design, test, and certify new weapons required for national defense; a concentration of inertial confinement fusion activities for weapons applications; advancing the state-of-the-art of nuclear weapons technology to assure that the U.S. is in the forefront of all technological initiatives, and monitoring the nuclear weapons stockpile to assure continued reliability and effectiveness. Efforts to explore new concepts will be accelerated within the nuclear weapons technology base and the effort to revitalize the weapons laboratory and test complex facilities will be continued.

The major objectives of the production and surveillance program are to continue to: produce and deliver new warheads, projectiles, and bombs for the U.S. nuclear weapons stockpile; provide and maintain modern manufacturing capabilities and capacities required for future production of weapons for enhancement of U.S. nuclear forces; and to maintain the U.S. nuclear weapons stockpile in a high state of readiness and reliability.

Verification and Control Technology

The goal of this program is to conduct the research, development, test, and support activities related to the detection of nuclear test activities in response to treaty verification and national security requirements; to provide the Department's expertise to significant nuclear intelligence, export control and arms control issues; and to review export license applications as required by the Atomic Energy Act as amended, the Nuclear Nonproliferation Act of 1978, and the Export Administration Act of 1979. The FY 1987 budget request emphasizes the fabrication, demonstration, and deployment of both research and operational verification systems.

Materials Production

The materials production program provides nuclear materials to meet near-term requirements for national defense, Departmental research and development programs, other government agencies, industry, and for processing of naval reactor spent fuels. The FY 1987 budget will allow the Department to continue to operate necessary production, processing, and support facilities and continue to sustain a base production program capable of meeting long-term nuclear materials production requirements consistent with the annual Nuclear Weapons Stockpile Memorandum approved by the President and the annual Department of Energy Materials Management Plan. Efforts will continue to ensure that the production facilities will be operated in a safe, secure, and environmentally acceptable manner.

Defense Waste and Byproducts Management

The defense waste and byproducts management program provides for the safe interim storage or utilization of nuclear wastes and byproducts generated primarily from nuclear materials production and naval propulsion while continuing the development of technologies and facilities for the final disposal of defense nuclear waste. The primary program elements: interim waste operations, long-term waste management technology, and terminal storage provide mainly for the handling and disposal of low-level and airborne radioactive waste, the storage of transuranic and high-level waste, development of technology for the long-term management of radioactive waste, and the demonstration of the safe disposal of defense waste. The FY 1987 request will enable the program to continue toward its goal to safely dispose of defense nuclear waste.

Nuclear Safeguards and Security

This program is responsible for developing measures to assure adequate protection of the Department of Energy's nuclear weapons, nuclear materials, facilities, and classified information against theft and sabotage. The program also provides safeguards-related technical support to U.S. and international activities designed to minimize the proliferation of nuclear weapons. The FY 1987 budget request will permit continuation of these vital program activities.

Security Investigations

The objective of the security investigations program is to ensure that the common defense and security of the U.S. is protected by an adequate background investigation and screening of those Department of Energy and Department contractor personnel who would, in the performance of their work, need access to Restricted Data, National Security Information or Special Nuclear Material, or who would occupy a designated Critical Sensitive position. Approximately 30,764 security investigations will be conducted in FY 1987.

Naval Reactors

The Naval Reactors Development program carries out nuclear propulsion development work essential to the U.S. Navy. Nuclear propulsion provides the Navy with ships having virtually unlimited high speed endurance, and allows ships to be designed with greatly increased capability for sustained combat operations. The program provides for the design, development, testing, and evaluation of improved naval nuclear propulsion plants and reactor cores having higher reliability, improved performance, and simplified operating and maintenance requirements. The nuclear propulsion plants and cores cover a wide range of configurations and power ratings suitable for installation in naval combatants varying in size from small submarines to large surface ships. In FY 1987, ongoing research, development, and test efforts will continue, including design and development of an Advanced Fleet Reactor which will provide enhanced performance for a new generation of nuclear power attack submarines.

Weapons Activities

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
ATOMIC ENERGY DEFENSE ACTIVITIES

VOLUME 1

Weapons Activities

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DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
WEAPONS ACTIVITIES
Atomic Energy Defense Activities

(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Appropriation	FY 1986 Adjusted Appropriation	FY 1987 Base	FY 1987 Request	Request vs. Base
Weapons Activities (DP)					
Research, Development, and Testing					
Operating Expenses	$1,461,337 a/	$1,413,609 i/	$1,413,609	$1,701,000	$287,391
Capital Equipment	132,150 b/	135,229 j/	135,229	189,570	54,341
Construction	196,550 c/	157,061 k/	157,061	186,830	29,769
Subtotal	$1,790,037	$1,705,889	$1,705,899	$2,077,400	$371,501
Inertial Fusion					
Operating Expenses	$ 23,797 d/	$ 22,568 l/	$ 22,568	$ 22,500	$ -68
Capital Equipment	1,300 e/	1,300 m/	1,300	1,300	0
Construction	0	0	0	0	0
Subtotal	$ 25,097	$ 23,868	$ 23,868	$ 23,800	$ -68
Production and Surveillance					
Operating Expenses	$1,806,282 f/	$1,739,789 n/	$1,739,789	$1,968,504	$228,715
Capital Equipment	119,400	125,300	125,300	132,000	6,700
Construction	385,989 g/	420,864 o/	420,864	401,700	-19,164
Subtotal	$2,311,671	$2,285,953	$2,285,953	$2,502,204	$216,251
Program Direction					
Operating Expenses	$ 57,534 h/	$ 95,100 p/	$ 95,100	$ 60,550	$-34,550
Subtotal	$ 57,534	$ 95,100	$ 95,100	$ 60,550	$-34,550
Total					
Operating Expenses	$3,348,950	$3,271,066	$3,271,066	$3,752,554	$481,488
Capital Equipment	252,850	261,829	261,829	322,870	61,041
Construction	582,539	577,925	577,925	588,530	10,605
Subtotal	$4,184,339	$4,110,820	$4,110,820	$4,663,954	$553,134
Staffing - Total FTE's					
Research, Development, and Testing	233	250	250	252	2
Production and Surveillance	654	671	671	777	106
Program Direction	799	826	826	838	12
Total	1,686	1,747	1,747	1,867	120

Authorization: Section 1, Public Law 83-703
Section 91, Atomic Energy Community Act of 1955

FY 1986 Adjusted Appropriation reflects $216,725,000 sequestered to comply with the Balanced Budget and Energy Deficit Control Act of 1985 (Public Law 99-177).

NOTE: Explanation of footnotes on following pages.

Footnotes for the FY 1987 Congressional Lead Table

a/ FY 1985 appropriation - $1,337,625,000. Reflects Automatic Data Processing general reduction of $5,212,000. Reflects Deficit Reduction Act of 1984, Public Law 98-369, reduction of $1,240,000. Reflects reprogramming of $2,750,000 to Project 85-D-102. Reflects comparability adjustment of $3,100,000 for the Los Alamos Meson Physics Facility transferred to the Energy Supply Research and Development appropriation. Reflects comparability adjustment of $5,061,000/100 FTE's transferred from Weapons Program Direction. Reflects comparability adjustment of $130,953,000 transferred from the Inertial Fusion Program.

b/ FY 1985 appropriation - $122,450,000. Reflects comparability adjustment of $9,700,000 transferred from the Inertial Fusion Program.

c/ FY 1985 appropriation - $190,300,000. Reflects reprogramming of $2,750,000 from Weapons Research, Development, and Testing operating for Project 85-D-102. Reflects comparability adjustment of $3,500,000 transferred from the Inertial Fusion Program.

d/ FY 1985 appropriation - $154,750,000. Reflects comparability adjustment of $130,953,000 transferred to Weapons Research, Development, and Testing.

e/ FY 1985 appropriation - $11,000,000. Reflects comparability adjustment of $9,700,000 transferred to Weapons Research, Development, and Testing.

f/ FY 1985 appropriation - $1,810,900,000. Reflects Automatic Data Processing reduction of $1,813,000 and $2,805,000 Deficit Reduction Act of 1984, Public Law 98-369.

g/ FY 1985 appropriation - $398,150,000. Reflects Management Initiatives reduction of $12,161,000.

h/ FY 1985 appropriation - $60,855,000. Reflects Management Initiatives reduction of $1,239,000. Reflects comparability adjustment of $5,061,000/100 FTE's transferred to Weapons Research, Development, and Testing. Reflects comparability adjustment of $2,979,000/17 FTE's transferred to the Office of the Assistant Secretary for Defense Programs as a result of a reorganization.

i/ FY 1986 appropriation - $1,371,800,000. Reflects $84,386,000 sequestered to comply with the Balanced Budget and Energy Deficit Control Act of 1985 (Public Law 99-177). Reflects comparability adjustment of $120,900,000 transferred from the Inertial Fusion Program. Reflects comparability adjustment of $5,295,000/100 FTE's transferred from Weapons Program Direction.

j/ FY 1986 appropriation - $131,450,000. Reflects $4,921,000 sequestered to comply with the Balanced Budget and Energy Deficit Control Act of 1985 (Public Law 99-177). Reflects comparability adjustment of $8,700,000 transferred from the Inertial Fusion Program.

k/ FY 1986 appropriation - $168,600,000. Reflects $2,875,000 sequestered to comply with the Balanced Budget and Energy Deficit Control Act of 1985 (Public Law 99-177). Reflects $8,500,000 general reduction. Reflects $164,000 Management Initiatives reduction.

l/ FY 1986 appropriation - $145,000,000. Reflects $1,532,000 sequestered to comply with the Balanced Budget and Energy Deficit Control Act of 1985 (Public Law 99-177). Reflects comparability adjustment of $120,900,000 transferred to Weapons Research, Development, and Testing.

m/ FY 1986 appropriation - $10,000,000. Reflects comparability adjustment of $8,700,000 transferred to Weapons Research, Development, and Testing.

n/ FY 1986 appropriation - $1,858,000,000. Reflects $104,561,000 sequestered to comply with the Balanced Budget and Energy Deficit Control Act of 1985 (Public Law 99-177). Reflects $6,700,000 Management Initiatives reduction. Reflects reprogramming of $1,900,000 to Program Direction. Reflects proposed appropriation transfer reduction of $3,800,000 for environmental assessment activities to the Energy Supply Research and Development appropriation. Reflects proposed appropriation transfer of $1,250,000 to the Departmental Administration appropriation for an FTE general clerical reduction.

o/ FY 1986 appropriation - $450,050,000. Reflects $18,450,000 sequestered to comply with the Balanced Budget and Energy Deficit Control Act of 1985 (Public Law 99-177). Reflects $3,600,000 general reduction and $7,136,000 Management Initiatives reduction.

p/ FY 1986 appropriation - $98,700,000. Reflects reprogramming of $1,900,000 from Weapons Production and Surveillance. Reflects comparability adjustment of $120,000/5 FTE's transferred to the Office of the Assistant Secretary for Defense Programs. Reflects proposed appropriation transfer reduction of $325,000/6 FTE's for environmental assessment activities to the Energy Supply Research and Development appropriation. Reflects comparability adjustment of $5,295,000/100 FTE's to Weapons Research, Development, and Testing. Includes $41,133,000 for termination of the Oak Ridge portion of the Community Assistance Program.

Department of Energy
FY 1987 Congressional Budget Request
Adjustments to FY 1986 Appropriations

	FY 1986 Confer.	General Reduction	Management Initiatives	Pay Cost Restoration	FTE General Reduction	Gramm-Rudman-Hollings	ES&H Transfer/ Reprogramming	Subtotal	Comparability Adjustments	Adjusted Approp. Total
Weapons Activities (DP)										
Research, Development, and Testing										
Operating Expenses	$1,371,800	$ -	$ -	$ -	$ -	$ -78,813	$ -	$1,292,987	$ +120,622	$1,413,609
Capital Equipment	131,450	-	-	-	-	-4,431	-	127,019	+8,210	135,229
Construction	168,600	-8,500	-164	-	-	-2,875	-	157,061	-	157,061
Subtotal	1,671,850	-8,500	-164	-	-	-86,119	-	1,577,067	+128,832	1,705,899
Inertial Confinement Fusion										
Operating Expenses	145,000	-	-	-	-	-7,105	-	137,895	-115,327	22,568
Capital Equipment	10,000	-	-	-	-	-490	-	9,510	-8,210	1,300
Construction	-	-	-	-	-	-	-	-	-	-
Subtotal	155,000	-	-	-	-	-7,595	-	147,405	-123,537	23,868
Production & Surveillance										
Operating Expenses	1,858,000	-	-6,700	-1,900[a]	-1,250	-104,561	-3,800	1,739,789	-	1,739,789
Capital Equipment	125,300	-	-	-	-	-	-	125,300	-	125,300
Construction	450,050	-3,600	-7,136	-	-	-18,450	-	420,864	-	420,864
Subtotal	2,433,350	-3,600	-13,836	-1,900	-1,250	-123,011	-3,800	2,285,953	-	2,285,953
Program Direction	98,700	-	-	+1,900[a]	-	-	-	100,600	-5,500	95,100
Subtotal, Weapons Activities	4,358,900	-12,100	-14,000	-	-1,250	-216,725	-3,800	4,111,025	-205	4,110,820
General Reduction	-12,100	+12,100	-	-	-	-	-	-	-	-
Management Initiatives:										
Operating Expenses	-6,700	-	+6,700	-	-	-	-	-	-	-
Capital Equipment	-	-	-	-	-	-	-	-	-	-
Construction	-7,300	-	+7,300	-	-	-	-	-	-	-
Total, Management Initiatives	-14,000	-	+14,000	-	-	-	-	-	-	-
FTE Reduction	-1,250	-	-	-	+1,250	-	-	-	-	-
Total, Weapons Activities	$4,331,550	$ -	$ -	$ -	$ -	$-216,725	$ -3,800	$4,111,025	$ -205	$4,110,820
Operating Expenses	3,465,550	-	-	-	-	-190,479	-3,800	3,271,271	-205	3,271,066
Capital Equipment	266,750	-	-	-	-	-4,921	-	261,829	-	261,829
Construction	599,250	-	-	-	-	-21,325	-	577,925	-	577,925

[a] Proposed reprogramming to cover pay cost absorption.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
WEAPONS ACTIVITIES
(In thousands of dollars)

Weapons Research, Development, and Testing

FY 1986 Adjusted Appropriation/FY 1987 Base	$1,705,899
Program increases and decreases:	
Escalation for operating expenses, basic capital equipment, and general plant projects	+ 89,350
Increase activity in the SDI area of the research, development, and testing program to achieve established milestones	+ 206,391
Increase in basic capital equipment in support of SDI	+ 36,391
Increase in General Plant Projects to achieve minimum acceptable level of support for maintenance of physical plant	+ 100
Increase in automatic data processing purchases to support increased requirement from SDI	+ 11,000
Two new starts in construction - an environmental project and a safeguards project:	
- Environmental Compliance and Cleanup, LLNL	+ 7,000
- Safeguards and Security Enhancement, Phase II, LLNL	+ 4,300
Maintain planned funding profile for prior-year projects	+ 16,969
FY 1987 Budget Request	$2,077,400

Inertial Fusion

FY 1986 Adjusted Appropriation/FY 1987 Base	$ 23,868
Program increases and decreases:	
Escalation for operating expenses	+ 1,071
Decrease experimental support to national laboratories	- 1,139
FY 1987 Budget Request	$ 23,800

Weapons Production and Surveillance

FY 1986 Adjusted Appropriation/FY 1987 Base	$2,285,953
Program increases and decreases:	
Escalation for operating expenses	+ 79,345
Escalation for capital equipment and general plant projects	+ 7,810
Increase operating expenses to meet DOD delivery schedule projections	+ 149,370
Increased level of equipment replacements	+ 2,617
Decrease in Automatic Data Processing acquisitions	- 2,203
Increase in general plant projects for essential activities only	+ 1,776
Reduced level of equipment and utility restoration activities	- 35,350
Initiate project for Short Range Attack Missile II production facilities	+ 5,000
Initiate one new environmental, safety, and health (ES&H) project:	
- ES&H Upgrade, Mound Plant	+ 2,400
Initiate one new safeguards and security project:	
- Shipping and Receiving Facility, Pinellas Plant	+ 300
Initiate Protective Clothing Decontamination Facility, Rocky Flats	+ 500
Continue and complete prior-year construction activities	+ 4,686
FY 1987 Budget Request	$2,502,204

Weapons Program Direction

FY 1986 Adjusted Appropriation/FY 1987 Base	$ 95,100
Program increases and decreases:	
Personnel-related expenses including salaries, benefits, and travel for 12 additional full-time equivalents plus cost-of-living increases, Federal Medicare and FICA contributions, and increased health benefits	+ 2,403
Provides for increased costs of contractual services	+ 3,797
Increase in the Los Alamos Community Assistance Program based on contract formula adopted by the Department of Energy Working Group on Community Assistance	+ 383
Terminates the Oak Ridge portion of the Community Assistance Program	- 41,133
FY 1987 Budget Request	$ 60,550

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW

The weapons program budget provides for essential effort required to support the research, development, testing, production, and lifetime surveillance of safe and reliable nuclear weapons to meet national defense needs. Research, development, and testing activities in FY 1987 will be pursued in support of weaponization requirements related to the W81 warhead for the Standard Missile-2, the W82 warhead for the Artillery Fired Atomic Projectile, the W87 warhead for the PEACEKEEPER system, the W88 TRIDENT II warhead, and the Antisubmarine Warfare/ Standoff Weapon. This budget is structured to continue to emphasize the technology base, especially areas related to the Strategic Defense Initiative, while still being responsive to the near-term needs for weaponization. The research and development employment in the weapons laboratories is planned to increase by about 800 full-time equivalents to support maintenance of an adequate technology base and in particular the strategic defense initiative.

The testing budget will support a balanced effort of nuclear device tests in FY 1987 and allow for the preparation required to support the testing effort in future years. Many of the proposed tests will be multipurpose and emphasis will be placed upon obtaining experimental information in the most cost-effective manner.

The Inertial Fusion research and development program previously conducted at the weapons laboratories will be integrated into the overall weapons research and development program, and therefore no longer funded as a separate program. The Inertial Fusion research and development conducted at the three non-Department of Energy laboratories will continue to be funded separately and will continue to focus primarily on the inertial fusion phenomenology as a non-weapon physics research endeavor.

The budget also provides for the production of new nuclear weapons for the stockpile and for the surveillance and maintenance of existing stockpile weapons as approved by the President. Included is the full-scale production of the B61-3 and -4 bombs, the W76 warhead for the TRIDENT, the W80-0 warhead for the Sea Launched Cruise Missile, the W80-1 warhead for the Air Launched Cruise Missile, the B83 Strategic Bomb, the W84 warhead for the Ground Launched Cruise Missile, and the W87 warhead for the PEACEKEEPER missile. Also included is the preproduction effort for the W81 warhead for the Standard Missile-2, the W82 warhead for the 155mm Artillery Fired Atomic Projectile, the W88 warhead for the TRIDENT II, and pre-Phase 3 systems including the Short Range Attack Missile II, Antisubmarine Warfare Weapon warheads, and the Small Intercontinental Ballistic Missile.

Reference is made throughout the budget to the weapons program phases that outline the functions and procedures which are followed in the "birth-to-death" cycle of a nuclear weapon. These phases were defined in a joint Atomic Energy Commission-Department of Defense agreement dated March 21, 1953. This agreement is still in effect and the only significant change to this portion of the original agreement has been the addition of Phase 7 and the division of Phase 2 into two distinct study efforts.

These phases are:

Phase 1 - Concept Definition
Phase 2 - Feasibility Study
Phase 2a - Design Definition and Cost Study
Phase 3 - Development Engineering or Full-Scale Development
Phase 4 - Production Engineering
Phase 5 - First Production
Phase 6 - Quantity Production and Stockpile
Phase 7 - Retirement

	FY 1986 Adjusted Appropriation	FY 1987 Request
Research, Development, and Testing	$1,705,899	$2,077,400
OPERATING EXPENSES	$1,413,609	$1,701,000
Research and Development	$ 912,251	$1,067,200
Testing	$ 501,358	$ 633,800

This program provides for the effort performed by the Lawrence Livermore National Laboratory, the Los Alamos National Laboratory, the Sandia National Laboratories, the Nevada Operations Office, and other contractors in research, development, and testing of nuclear weapons. This includes research, development, engineering, and certification of nuclear warheads required by the Department of Defense for stockpile, investigation of concepts and technologies for future weapons, and advancement of the sciences and technologies applicable to nuclear weapons as well as related activities in the strategic defense initiative. The inertial fusion activities at the weapons laboratories have been incorporated into the research, development, and testing program because of their contribution to the weapons technology base.

The research, development, and testing program is directed toward the generation of new ideas in weapon concepts and technologies and the application of these developments to continuing, new, or evolving Department of Defense requirements in a timely, efficient, and economical manner.

The goals of the research, development, and testing program are the development and application of nuclear weapons technology and nonnuclear scientific and engineering support to maintain and improve current nuclear weapons systems, and to develop new weapons for the United States nuclear weapons stockpile in accordance with identified national security requirements.

The major objectives to be accomplished to achieve the program goals are as follows:

- Maintain the capability to design, test, and certify new nuclear weapons required for national defense.
- Understand the basic technologies involved in nuclear weapon operation, manufacture, and maintenance and thereby provide enhanced efficiency and reliability.
- Explore feasible nuclear weapon concepts in order to know what designs are possible for us or for our adversaries.
- Understand nuclear weapon outputs, effects, and vulnerabilities.
- Monitor the nuclear weapons stockpile to assure continued reliability and effectiveness.
- Improve analytical and experimental capabilities to support the nuclear weapons development process.
- Investigate the feasibility of directed energy weapons to assess adversary threat in support of the President's Strategic Defense Initiative.
- Conduct inertial fusion research to improve understanding of weapon physics and develop laboratory-scale effects capability.

Laboratory research and development employment and the level of underground nuclear device tests are approximate indicators of the levels of effort being devoted to these activities. The following table summarizes and compares the FY 1986 level of effort and the programs that can be accommodated within the FY 1987 request.

	FY 1986 R&D Employment		FY 1987 R&D Employment	
	Direct	Total	Direct	Total
Weapons technology base	2,580	4,970	3,050	5,850
Weapons development, engineering, and certification	1,630	3,530	1,590	3,450
Testing capabilities	18	30	18	30
Special projects	272	500	282	520
Total	4,500	9,030	4,940	9,850

The request includes a Federal employment level of 252 full-time equivalents at the following offices:

Nevada Operations Office	102
Los Alamos Area Office Support Staff	142
San Francisco Operations Office Couriers	8
Total	252

Technology base activities provide the fundamental scientific and engineering data base and facility capabilities upon which this Nation's nuclear weapons research, development, engineering, and certification efforts are based. The primary emphasis in this area is on providing an inventory of proven ideas and concepts for timely and effective application to evolving Department of Defense system requirements; the conduct of basic studies in unique areas of physics, mathematics, chemistry, and the engineering sciences that will provide tomorrow's advances in nuclear weapons technology; and the maintenance of a central core of facilities and capabilities unique to nuclear weapon design. In FY 1987, approximately $880,000,000 will be devoted to technology base activities compared to $680,409,000 in FY 1986 to support achievement of strategic defense initiative milestones and to maintain required competence in nuclear bomb and warhead technology.

Efforts within the technology base category include:

1. Advanced concepts - Develops design concepts and components with potential for future Department of Defense systems applications. Emphasis will continue in areas where exploratory experimentation is expected to provide significant payoffs during the intermediate term. However, increased effort will be expended on investigations of concepts such as directed energy weapons activities having longer term payoffs as well.

2. Supporting research - Includes those program areas that are fundamental to nuclear weapon development. Included under supporting research are most of the disciplines associated with the physical, chemical, mathematical, and engineering sciences.

3. Supporting technologies - Includes those activities related to improved utilization of laboratory experimental facilities and capabilities; increased understanding of advanced materials and their potential applications; development of processes to formulate and fabricate new materials; and the development and application of computer codes to understand and interpret the physics of nuclear, laser, microwave, and particle beam devices and to analyze and predict the response of engineering materials and structures to various environments.

Technology base activities have traditionally supported nuclear bomb and warhead development, but in recent years nuclear-driven directed energy weapon research has become increasingly important as a factor in the search for a strategic defense capability.

Nuclear-Driven Directed Energy Weapons Research

This is a project to determine the feasibility of nuclear-driven directed energy weapons (NDEW). Nuclear research is included in the Strategic Defense Initiative (SDI) program for two reasons: (1) threat definition; and (2) defensive system options. Threat definition refers to understanding the Soviet's capability to design and deploy NDEW which would put the U.S. retaliatory force or a future defensive system at risk. These data are required as soon as possible because of the potential impact they could have on current nonnuclear SDI research and planning. Nuclear directed energy weapons are also being researched as U.S. SDI options because of their potentially unique capabilities and as a hedge against the failure of nonnuclear defensive weapons to meet performance requirements.

The Department of Energy is presently conducting research on five NDEW concepts: x-ray lasers, hypervelocity pellets, microwaves, particle beams, and optical lasers.

Research efforts for the next several years include basic theoretical physics, computer modeling and laboratory experimental validation, diagnostic instrumentation development, chemistry and materials research, dedicated underground nuclear experiments, engineering research on potential platform configurations, and systems analyses.

The inherent advantages of NDEW's are their relatively small size, low mass, and high power features. NDEW's essentially represent a new generation of precisely tailored effects from a nuclear explosives device. The NDEW concepts will require significant advances into new regimes of basic physics not previously explored at such depth, especially laser physics, plasma processes, and atomic physics. In addition, the most advanced supercomputers for experiment and weapon modeling, problem analysis, artificial intelligence, discrimination, and communications capabilities will be required. Also required are new levels of engineering precision heretofore unattained. The overall problem is very complex.

A basic concept of nearly all NDEW's involves the conversion of energy from a nuclear explosive device. Specifically, conversion of one or more forms of the prompt output of the explosion (x-rays, gamma rays, or neutrons) to some other form of energy and redirection of that energy. This may be a several step process with the final form of the directed energy being x-rays, hypervelocity projectiles, microwaves, optical frequency photons, or atomic particles (electrons and protons).

Although we have prioritized the NDEW research, at this time it would be premature to down-select among any of the NDEW concepts. As research proceeds, the various NDEW concepts will be continually reviewed relative to projected military utility and likelihood of scientific success in order to meet Strategic Defense Initiative Office technical feasibility decision milestones on competing concepts for the early 1990's.

Supporting Research for NDEW Concepts

Vulnerability, Lethality, and Countermeasures

The investigation of vulnerability, lethality, and countermeasures is included for all of the NDEW concepts. This research is vital because it evaluates the effectiveness of particular defensive weapon concepts. Countermeasures and countertactics will be studied in terms of hardening and shielding targets from attack, evading attack, and restricting attacks as well as evaluating NDEW concept effectiveness.

System Studies

System studies are conducted concurrently with NDEW concept research to focus on the operation and role of each concept as part of an integrated strategic defense system architecture. The viability of a given concept within a total system framework as well as the given concept's distinct merit will be a consideration in arriving at a technical feasibility decision to proceed with engineering development. System studies also encompass risk, stability, and threat assessments in potentially moving from a retaliatory deterrent posture to a defensive deterrent posture.

New and Innovative Concepts

Members of the scientific community, academia, and industry will be offered opportunities to identify new and innovative ideas on NDEW concepts and supporting research related to vulnerability, lethality, and countermeasures. The ideas generated may provide a catalyst for new approaches in the research conducted by the national laboratories.

During FY 1987, underground nuclear device tests will be conducted at the Nevada Test Site in support of technology base activities. These field tests are an integral element in confirming the feasibility and practicality of the ideas and concepts developed in the technology base category.

Weapons development, engineering, and certification activities are guided by current national requirements for providing new strategic nuclear weapon options, for modernizing tactical nuclear weapons, and for monitoring and maintaining the reliability of all nuclear weapons now in stockpile. All Phase 3 development engineering requests are transmitted formally by the Department of Defense to the Department of Energy through the Military Liaison Committee. Approximately $474,500,000 will be allocated to weapons development, engineering, and certification efforts in FY 1987 compared to $438,900,000 in FY 1986.

Weapons development, engineering, and certification activities for weapons systems that will be in at least Phase 3 in FY 1987 will include the following:

W81 Standard Missile-2 Warhead

The W81 nuclear warhead for the Navy's Standard Missile-2 will provide a defensive capability against nuclear-armed air, surface, and submarine launched cruise missile threats.

W82 155mm Artillery-Fired Atomic Projectile (AFAP) Warhead

The W82 warhead is being developed as a replacement for the obsolescent W48 as part of the Army's AFAP modernization program. This warhead will have better range, accuracy, and reliability than the W48.

W87 PEACEKEEPER Warhead

The W87 warhead is being designed to incorporate insensitive high explosive, improved fire resistance, and other enhanced safety features for application in the PEACEKEEPER system.

W88 TRIDENT II Warhead

The W88 warhead is being developed to provide a high yield capability for the Sea Launched Ballistic Missile force. The warhead/reentry body combination is a new design to provide enhanced kill capability.

Antisubmarine Warfare/Standoff Weapon (ASW/SOW)

The ASW/SOW will be a new depth bomb replacement for the current SUBROC/W55.

Antisubmarine Warfare Nuclear Depth/Strike Bomb (ASW ND/SB)

The ASW ND/SB will be a new air-dropped, dual purpose replacement for the B57 and some B61 Mods for the U.S. Navy.

Small Intercontinental Ballistic Missile (SICBM)

The SICBM will be a small single warhead ICBM in one or several basing modes with emphasis on mobility.

Other candidate systems will continue in or could enter Phase 1 concept definition study status, Phase 2 feasibility study status, or Phase 2A design definition and cost study status during FY 1987.

Weapons development, engineering, and certification effort also includes stockpile improvement, future weapons, and stockpile management. The stockpile improvement effort is intended to extend the stockpile life of existing weapons by incorporating technical improvements such as insensitive high explosives. These improvements are a cost-effective alternative to replacement of existing weapons. Future weapon efforts cover pre-Phase 1, Phase 1, Phase 2, and Phase 2A studies of nuclear weapon systems. Stockpile management includes a small research and development effort in support of production and monitoring of the stockpile.

Testing capabilities category encompasses those activities necessary to maintain and enhance capabilities for conducting nonnuclear laboratory scale and field experiments and for conducting full-scale underground nuclear device tests at the Nevada Test Site. Included in this category are efforts directed toward (1) improving the technology in all areas of testing that are relevant to the nuclear weapons program, (2) insuring that all nuclear device tests are executed in a safe and environmentally acceptable manner, (3) maintenance and operation of the Nevada Test Site, (4) provision of logistical support to the laboratories and other technical organizations that participate in test activities at the Nevada Test Site, and (5) preparatory activities for future testing at the Nevada Test Site. In FY 1987, program and funding requirements permitting, increased emphasis will continue to be placed upon improvements in such areas as containment technology; drilling, emplacement, and stemming techniques; prompt diagnostics incorporating digitized data and fiber optics; and radiochemistry diagnostic techniques and analysis. In FY 1987, approximately $275,600,000 will be devoted to testing capabilities compared to $233,700,000 in FY 1986.

Special projects category includes activities that utilize many of the scientific and technical capabilities employed in the design and development of nuclear weapons to support related needs. Major areas of emphasis include research and development efforts related to improved hardware, systems, and procedures for the protection of nuclear weapons and strategic quantities of special nuclear material during shipment and storage; the operational costs associated with maintenance of the Department of Energy's Nuclear Emergency Search Team (NEST) capabilities located at Las Vegas, Nevada, and Andrews Air Force Base, Maryland; and research efforts directed toward the development of improved search and detection systems and techniques and other special studies and audits. This category also contains the funding for federal employment and related services in support of the research, development, and testing effort. In FY 1987, approximately $66,500,000 is planned for special projects compared to $55,900,000 in FY 1986.

Marshall Islands Environmental Program category includes costs incurred in carrying out the Department's health and environmental obligations and responsibilities with respect to residual studies relating to the United States nuclear weapons atmospheric testing program, primarily in the Marshall Islands. The FY 1987 funding request assumes transition of the Marshall Islands effort from the United States Government to the Government of the Marshall Islands as called for under the Compact of Free Association. In FY 1987, approximately $4,400,000 is planned for this work compared to $4,700,000 appropriated in FY 1986.

Following is the list of automatic data processing leases planned for FY 1987.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Lawrence Livermore National Laboratory		
Cray X/MP 48	$ 6,865	$ 5,435
Class VI/VII	4,575	9,150
Class VII	0	5,015
Total, Lawrence Livermore National Laboratory	11,440	19,600
Los Alamos National Laboratory		
Cray 1, (3)	1,700	280
Cray X/MP (1)	2,300	2,300
Cray X/MP (2)	2,930	2,200
Cray X/MP (3)	3,510	760
Class VII	0	4,910
Total, Los Alamos National Laboratory	10,440	10,450
Sandia National Laboratories		
Laser printer, SNLA	140	140
Integrated file storage, SNLA	250	0
Administrative data processing centers, SNLA	500	0
Cray X/MP 24, SNLA	5,800	3,400
Network upgrade and storage completion, SNLL	370	370
Cray 1S, SNLL	1,900	0
Alphanumeric computer output microfilm, SNLA	150	0
Open timesharing expansion, SNLA	250	500
Interface buffer high performance graphics, SNLA	200	300
Class VI/VII, SNLA	0	5,600
Class VI/VII, SNLL	0	900
Total, Sandia National Laboratories	9,560	11,210
Total, ADP Leases	$31,440	$41,260

A discussion of new FY 1987 items follows.

	FY 1987 Request
Lawrence Livermore National Laboratory (LLNL)	
Class VII	$ 5,015
Los Alamos National Laboratory (LANL)	
Class VII	4,910

The use of high speed computers and mathematical models to simulate complex physical processes has been and continues to be the cornerstone of the weapons design. It is a key factor in maintaining the nuclear weapons technology base. Virtually all the major innovations in weapons design and physics understanding have been tied to advances in computational capability. To provide the best possible weaponry, we must have the best possible computational resources. Major new weapons design programs and a very rapid growth in strategic defense technology research will require us to sustain our rate of growth in computing capability and capacity. Class VII computers are consistent with growth plans, which involve the periodic selection of a computer that represents the state-of-the-art and provides a new level of capability, followed by additional acquisitions of similar machines to provide needed increments of capacity.

Requirements for the Class VII capabilities were established by the laboratories in FY 1985 and requests for Class VII's were included and approved in that year's budget. However, it appears that a new supercomputer that would be qualified to be designated a

Class VII machine will not be ready until FY 1987. Since this machine will probably be the first machine of a new class, the Class VII's will be leased in order that its performance and reliability can be proved before purchase.

	FY 1987 Request
Sandia National Laboratories (SNL)	
Class VI/VII (SNLA)	$ 5,600

The proposed Scientific Supercomputer will consist of four or more CPU's, 8 million or more words of memory and associated peripherals as needed to meet functional specifications. Weapon designs are becoming more complex as increased demands are placed on modern weapon systems. These demands require an increase in the quantity and quality of analysis for designs. Further research in these areas is vital to the development of new weapon concepts. Engineering, scientific, and systems applications in the laboratories demand additional high performance interactive capacity and capability to allow us to carry out our assigned mission more efficiently and in a manner which makes the most effective use of funds.

Class VI/VII (SNLL)	900

The present computational facilities are expected to be saturated, necessitating additional capacity if Sandia is to fulfill its mission. The installation of a new scientific computing system will not only increase computational capacity, but will also increase the capability to solve larger, more complex problems. The need for increased capability will come through efforts providing computer codes that more closely model the physical world including two- and three-dimensional problems.

No major items of ADP equipment are requested for lease in the testing program in FY 1987.

	FY 1986 Adjusted Appropriation	FY 1987 Request
CAPITAL EQUIPMENT	$ 135,229	$ 189,570
Research and Development	91,022	117,570
Testing	44,207	72,000

An adequate capital equipment base is crucial to maintaining the viability of the nuclear weapons complex. Physical and technological deterioration of equipment in the research, development, and testing facilities has been and continues to remain a serious concern. The need to repair past deterioration in basic equipment and the rising cost of technically advanced equipment in the areas of diagnostics and ADP argue for a substantial increase, even in the face of budgetary constraints. Evaluation of various directed energy concepts will require both laboratory and underground nuclear effects experiments with advanced diagnostics to record results.

Basic Equipment	$ 103,329	$ 146,670
Research and Development	60,372	74,670
Testing	42,957	72,000

Basic equipment funding continues to be a high priority at the laboratories and the Nevada Test Site. For FY 1987, the sites were asked to develop funding estimates for basic equipment which would halt further deterioration in the equipment base. Within these estimates, some basic equipment funding is requested for acquiring new, advanced capability. State-of-the-art diagnostic and experimental tools play a key role in the success of research and development efforts at the laboratories. Equipment acquired by the laboratories is unique and represents new capability--rather than redundancy or efficiency. Other basic equipment is requested to increase capacity at the same level of technology. This portion of the request contributes to the efficiency of the programs. The basic equipment request is also directed toward replacement of equipment which will wear out or become technically obsolete in FY 1987.

The majority of the increase in basic equipment will be used to support the Strategic Defense Initiative program in FY 1987. Overall, the increase will provide for the appropriate balance of equipment resources in conjunction with the operating program.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Automatic Data Processing (ADP)	$ 31,900	$ 42,900
Research and Development	30,650	42,900
Testing	1,250	0

Scientific computers are an essential tool for fulfilling the mission of the weapons design and engineering of the research, development, and testing program. Current weapon design and engineering problems have become increasingly complex and formulation of adequate solutions requires the most advanced computational resources in the world. To date, our laboratories have been in the forefront of computer science and the investment in computing hardware and software is substantial. Hardware includes the large computer mainframes, output devices, networks and communications; software is all of the operating systems, networking, communications, in addition to the models and algorithms which permit, in some cases, the only means to design and simulate many of our most advanced concepts. Modeling is cost effective when compared to the alternative of testing certain aspects at the Nevada Test Site. While computer modeling will never completely replace the need for underground tests, computing is playing an ever-increasing role to better prepare for tests and maximize their utility.

Acquisition of computer integrated manufacturing (CIM) for the laboratories is also funded under this heading. Progress to date has been very good--the complex is proceeding toward complete automated exchange of product definition information for the Trident II warhead development activities.

The following table details requested ADP acquisitions by location.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Lawrence Livermore National Laboratory (LLNL)		
Computer hardcopy output recording system (CHORS) II, Phase 2A	$ 1,500	$ 0
CHORS II, Phase 2B	0	1,000
Storage system, Phase 2A	1,000	0
Storage system, Phase 2B	0	5,000
Management information data base computer	1,000	0
CIM, Phase 4	3,000	4,200
Total, LLNL	6,500	10,200
Los Alamos National Laboratory (LANL)		
Administrative computer	0	1,500
Mass storage upgrade	3,000	1,200
Cray X/MP (2nd)	10,500	0
Cray X/MP (3rd)	0	13,650
CIM	2,000	4,200
Total, LANL	15,500	20,550
Sandia National Laboratories (SNL)		
Integrated file storage expansion, SNLA	850	0
Cray X/MP 24, SNLA	0	5,500
Alphanumeric computer output microfilm, SNLA	700	0
Open timesharing expansion, SNLA	0	1,550
Cray-1S, SNLL	3,900	0
Integrated file storage expansion - Phase II, SNLA	500	0
Networks upgrade, SNLL	0	1,100
CIM, SNLA and SNLL	2,700	4,000
Total, SNL	8,650	12,150
Nevada Operations Office		
Distributed Network	1,250	0
Total, ADP Purchases	$ 31,900	$ 42,900

Major Items of Equipment - Automatic Data Processing

Major items of automatic data processing equipment are discussed by site in the narrative below.

	FY 1987 Request
Lawrence Livermore National Laboratory	
CHORS II, Phase 2B	$ 1,000

The large volume of computation in the computers gives rise to a large volume of text and picture output to convey the results to computer users. This output is produced via several means with the vast majority of output produced by CHORS, a centralized high-speed, high-quality system producing both hardcopy paper and a variety of microfilm output. Phase 2B is needed to provide additional hardcopy capacity.

FY 1987
Request

Storage System, Phase 2B .... $ 5,000

A most critical computer network requirement is the management, movement, storage, and control of "files" - computer generated information of various forms. LLNL has developed a multilevel storage hierarchy approach as the best means of providing storage support within OCTOPUS. Failure to provide adequate on-line storage in a time frame commensurate with increases in computing capacity will seriously hamper the efficient use of the large computers and affect the programmatic efforts.

Computer Integrated Manufacturing, Phase 4 4,200

Phase 4 of this multi-year project is needed to provide expanded engineering capability. The following four areas in the weapon engineering design cycle will benefit: design/drafting; engineering modeling and analysis; manufacturing; and engineering design documentation.

Los Alamos National Laboratory

Administrative Computer 1,500

A new computer-based information system will provide laboratory-wide interactive access to all administrative information. A computer is needed to replace the existing central processor for the large data bases. It will be connected to the integrated computer network to supplement the distributed processors currently used. Vendor-supported application software has proven to be cost effective for those distributed processors. Software for the current central processor is extremely scarce and insufficient to meet the needs of the laboratory. Therefore a large, software-rich administrative computer is proposed as a key element to improve the quality and capability of the information management system.

Mass Storage Upgrade 1,200

The effectiveness of the large central machines, which is so essential to the success of our national security programs, would be severely diminished if the mass storage facility did not provide adequate response to file access request, and if it were unable to satisfy on-line and archival data storage requirements in a reliable and timely manner. This completes the funding requirements for this FY 1986 item.

Cray X/MP (3rd) 13,650

This funding provides for the cost-effective buyout of a Cray X/MP 48 leased and supported in FY 1986.

Computer Integrated Manufacturing 4,200

The request provides for additional required CIM capability. Planned acquisitions include mainframes, workstations, data storage and output equipment, and network upgrades.

Sandia National Laboratories

Cray X/MP 24 (SNLA) 5,500

This provides for a buyout of this computer installed in the laboratory in May 1985.

Open Timesharing Expansion (SNLA) 1,550

The CDC Cyber 170/855 has been converted to a new operating system which will create a virtual memory environment for users of this machine. This enhanced software capability will increase the need for central processing unit capacity, which is already strained during peak periods. At least one million words of additional memory will also be needed to support both the current and virtual modes. The postponement of this expansion would adversely affect about 2,000 [illegible]s.

	FY 1987 Request
Network Upgrade	$ 1,100

This item is for equipment to upgrade and add functionality to the scientific computer network. A scientific computing system is proposed that will increase capacity to fulfill programmatic responsibilities. In order to fully utilize this new system and to get optimal use from the present VAXs and Crays, the capabilities of the scientific computing network must also be altered and expanded.

Computer Integrated Manufacturing	4,000

This item consists of equipment to be used for computer-aided engineering (CAE) support for conceptual design simulation and verification, engineering analysis and preliminary design, design definition, manufacturing, and test. The additional equipment is required for improved weapon designs and shorter time scales. It will increase capacity and capability for computer aids to all phases of weapon development. It will add peripherals and communications networks/links necessary for an integrated CAE network. This network will link engineers, designers, analysts, parts programmers, and others who need direct access to the weapon data bases.

No major items of ADP equipment are requested for the testing program in FY 1987.

	FY 1986 Adjusted Appropriation	FY 1987 Request
CONSTRUCTION	$157,061	$186,830
Research and Development	135,661	149,830
Testing	21,400	37,000

The following is a table listing the construction line items included in the FY 1987 research, development, and testing budget request. Further details may be found in the individual construction project data sheets.

Research and Development

Project Numbers	Title	TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
New Projects				
87-D-101	General plant projects, VL	$ 21,300	$ 0	$ 21,300
87-D-102	Environmental compliance and cleanup, LLNL	134,000	0	7,000
87-D-104	Safeguards and security enhancement, Phase II, LLNL	67,400	0	4,300
	Total New Projects		$ 0	$ 32,600
Prior-Year Projects				
86-D-101	General plant projects, VL	$ 19,800	$ 19,800	$ 0
86-D-103	Decontamination and waste treatment facility, LLNL	36,400	3,600	5,400
86-D-104	Strategic Defenses Facility, SNLA*	70,000	2,000	15,000
86-D-105	Instrumentation Systems Laboratory, SNLA	20,000	3,100	8,900
86-D-106	Laboratory Data Communications Center, LANL	25,000	1,000	14,000
85-D-102	Nuclear weapons research, development, and testing facilities revitalization, Phase 1, VL	152,300	35,000	57,600
85-D-103	Safeguards and security enhancements, Livermore, CA	41,100	16,000	6,900
85-D-106	Hardened engineering test building, LLNL	3,130	1,800	430
84-D-102	Radiation-hardened integrated circuit laboratory, SNLA	40,500	15,500	3,000
84-D-104	Nuclear materials storage facility, LANL	18,575	11,375	0
84-D-105	Safeguards and security upgrades, Phase I, LANL	14,650	7,050	0
84-D-106	Security system upgrade, SNLA	3,800	1,900	0
83-D-199	Buffer land acquisition, Livermore, CA	33,700	9,700	0
82-D-144	Simulation technology laboratory, SNLA	40,000	10,300	6,000
	Total prior-year projects		138,125	117,230
	General Reductions and Management Initiatives		- 2,464	0
	Total research and development		$135,661	$149,830

Testing

Project Numbers	Title	TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
New Projects				
87-D-101	General plant projects, VL	$ 7,700	$ 0	$ 7,700
	Total new projects		$ 0	$ 7,700
Prior-Year Projects				
86-D-101	General plant projects, VL	$ 7,700	$ 7,700	$ 0
85-D-105	Combined device assembly facility, NTS	69,500	7,000	14,000
84-D-107	Nuclear testing facilities revitalization, VL	79,240	12,900	15,300
	Total prior-year projects		27,600	29,300
	General Reductions and Management Initiatives		- 6,200	0
	Total testing		$ 21,400	$ 37,000

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*Funded jointly with DOD.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Inertial Fusion	$ 23,868	$ 23,800

The Inertial Fusion research and development previously conducted at the three weapon laboratories will be integrated into the overall weapons program. Accordingly, there is no funding for Inertial Fusion as a separate program at the weapons laboratories. The NOVA and PBFA II facilities will be used for weapons simulation and other weapons related research and development.

Three major non-DOE laboratories (KMS Fusion, the University of Rochester Laboratory for Laser Energetics, and the Naval Research Laboratory), are funded specifically as Inertial Fusion programs, since they principally focus on the inertial fusion phenomenology itself as a non-weapon physics research topic. In addition, these programs using complementary experimental capabilities, provide direct experimental support and complementary scientific data for weapons research and development using the NOVA and PBFA II facilities at the national weapons laboratories.

	FY 1986 Adjusted Appropriation	FY 1987 Request
OPERATING EXPENSES	$ 22,568	$ 22,500

This funding will allow the support laboratories to continue to support the high energy driver and target experimental campaigns being carried out at Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Sandia National Laboratories. In addition, these laboratories will continue to acquire laser/plasma physics data which are necessary to define the target characteristics and irradiation conditions required to achieve the goal of weapons physics research.

KMSF	$ 13,125	$ 12,000

In FY 1987, KMSF will continue to acquire laser/target interaction data which is useful for the high performance experimental target designs to be employed on NOVA and will continue developing a high performance target fabrication technology capability in support of ongoing inertial fusion driver and target experiments. In addition, KMSF will support the experimental program of all weapons physics fusion facilities by continuing to provide unique targets, experimental components, and diagnostics.

University of Rochester	$ 6,943	$ 8,000

In FY 1987, the University of Rochester will execute experiments designed to compress fuel masses to over 100 times liquid hydrogen density using cryogenic liquid fuel targets. The University will also continue the drive uniformity program using cryogenic targets, with expected reduction of drive non-uniformity to ± 3 percent at short wavelength irradiation and will pursue the theoretical program associated with understanding the data acquired in these experiments. The systematic acquisition of this implosion data is important to understanding drive uniformity requirements for implosion physics, and how to design and irradiate targets.

Naval Research Laboratory	$ 2,500	$ 2,500

In FY 1987, the Naval Research Laboratory plans to acquire laser/plasma interaction data and to observe plasma instability growth phenomena at increasingly greater laser power and intensities. At these higher power levels, Rayleigh-Taylor instability growth rate regimes will be more nearly characteristic of such phenomena in targets that would be imploding under actual thermonuclear burn conditions. On this basis, the systematic acquisition of physics data on the growth of such instabilities and on their influence in controlling the efficiency of a thermonuclear burn are critical to establishing the physical requirements for stable implosions.

	FY 1986 Adjusted Appropriation	FY 1987 Request
CAPITAL EQUIPMENT	$ 1,300	$ 1,300

This funding will approximately maintain the FY 1986 level and will provide funding to support the capital equipment needs for the three support laboratories.

CONSTRUCTION	$ 0	$ 0

	FY 1986 Adjusted Appropriation	FY 1987 Request
Production and Surveillance	$2,285,953	$2,502,204

OPERATING EXPENSES	$1,739,789	$1,968,504

Weapons production and surveillance activities involve the procurement of materials (exclusive of nuclear materials); fabrication and assembly of nuclear weapons and weapon components; stockpile maintenance; reliability assessment of the existing stockpile; and development of safe-secure transportation, field transportation, field training manual preparation, and facility standby/startup required to maintain the United States national defense posture as approved by the President.

This request supports the current schedules for near-term weapon deliveries, modifications, and retirements. For 1990 and beyond, the schedule also reflects the current Nuclear Weapons Stockpile Memorandum (NWSM). The delivery schedule for the W87 PEACEKEEPER warhead has been revised, consistent with language contained in the FY 1986 Defense Authorization Act, limiting warhead production to the number required to arm currently authorized missiles.

Funding for the weapons production and surveillance operating expenses activities follows:

	FY 1986 Adjusted Appropriation	FY 1987 Request
War reserve new production	$1,060,340	$1,159,426
Stockpile maintenance	195,180	193,478
Stockpile evaluation	202,880	192,600
Process development	96,900	101,600
Other costs	289,050	321,400
Unallocated	-104,561	0
Total	$1,739,789	$1,968,504

War reserve new production	$1,060,340	$1,159,426

This subactivity includes costs incurred for procurement and/or manufacture of materials, piece parts, and assemblies required in the final assembly of warheads to be delivered to the Department of Defense in direct compliance with the Nuclear Weapons Stockpile Memorandum covering the budget period as well as future years, and for production/process engineering required to support future weapons delivery.

After taking into account the effects of escalation, $46,733,000, the real growth in War Reserve New Production is $52,353,000, or 4.9 percent over FY 1986. This results from both positive and negative changes in the total workload.

Stockpile maintenance	$ 195,180	$ 193,478

This subactivity includes funding required to maintain weapons and weapon components currently in the nuclear weapons war reserve stockpile and those to be delivered to the stockpile. Included are the costs associated with repairing nuclear weapons and significantly modifying or modernizing older nuclear weapons in the stockpile. Funding is also provided to procure, fabricate, and assemble material and piece parts into weapon components which will be used to replace like components having limited life, including special nuclear materials. The costs incurred to retire and disassemble nuclear weapons from the stockpile are also funded under this subactivity. There is no growth in this area from FY 1986 to FY 1987.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Stockpile evaluation	$ 202,880	$ 192,600

This subactivity provides the funding required to assure the high quality and reliability of nuclear weapons and components in the war reserve stockpile and those products to be delivered to the stockpile. A vigorous reliability assessment program is necessary to continuously evaluate and determine that nuclear weapons are produced according to design specifications and that transportation, deployment, and storage of nuclear weapons do not result in performance, life use, maintainability, reliability, or safety degradation. Quarterly reliability reports are issued for every weapon throughout its stockpile life. This activity maintains the required level of effort in FY 1987.

Process development	$ 96,900	$ 101,600

This subactivity is directed toward (1) solving current problems and adequately supporting all current and planned production of new weapon components in Phase 3, (2) developing new processes to improve production operations by reducing process time and/or reducing attrition of materials and improving process yields, and (3) developing process and production techniques required to support necessary advanced technologies in order to provide for an efficient transition of new technologies into Phase 3 development programs for future weapons as defined by the weapons design laboratories.

This subactivity is increased by $4,700,000 in FY 1987 to reflect increased preproduction activities for systems entering production in 1989 and later. This reflects the DOE's commitment to joint laboratory/plant efforts for earlier and more intensive preproduction activities, with a goal of minimizing producibility problems when systems enter production.

Other costs	$ 289,050	$ 321,400

This subactivity provides funding for those costs incurred in the weapons production complex that are not properly defined as part of product costs. It includes (1) nuclear materials recycle and recovery activities, (2) field engineering and training activities, (3) secure transportation activities, (4) facilities startup and standby activities, and (5) other miscellaneous costs including changes in inventory balances. Also reflected is a general increase in operating expenses for the weapons program associated with the redistribution of costs resulting from maintaining the K-25 operation at Oak Ridge in a shutdown condition. The request is detailed below.

Nuclear material recycle and recovery	$ 181,550	$ 218,200
Field engineering and training activities	3,860	4,200
Secure transportation	42,845	46,900
Facility startup/standby	14,345	10,400
Miscellaneous	46,450	41,700
Total	$ 289,050	$ 321,400

A significant portion, $218,200,000, of the total funds included in the other cost category is for nuclear material recycle and recovery activities conducted at the Mound, Oak Ridge, Rocky Flats, and Savannah River weapon production facilities, and the Los Alamos National Laboratory (LANL). Tritium is recovered at the Mound Plant, enriched uranium and oralloy are recovered at Oak Ridge, and plutonium is recovered at Rocky Flats. Savannah River recovers and purifies tritium from returned reservoirs. The major cost increase in FY 1987 results from the Office of Military Application providing a greater fraction of funding support to LANL's scrap recovery and plutonium metal production activities. These costs have been shared with the Office of Nuclear Materials Production (ONMP). Because ONMP's program activities at LANL are being reduced, the production and surveillance program must assume a larger share of costs to continue to meet production and surveillance material requirements.

A related issue in this area concerns Building 371, the Plutonium Recovery and Waste Treatment Facility, at Rocky Flats. A study is currently underway to determine the need, scope, and capacity requirements for options to modify the building to correct existing deficiencies in processing capabilities. Should the Department decide to modify Building 371, it could appear as a construction line item in FY 1988.

Also included within this subactivity are field engineering, training, technical, and administrative services provided to the DOD and DOE weapon production plants by Sandia National Laboratories. FY 1987 costs are estimated to be $4,200,000, supporting the current level of effort.

The secured transportation shipments of nuclear weapons, weapon components, and all "strategic" or "trigger" quantities of all Government-owned special nuclear materials are included in this subactivity. These costs include the salaries, fringe benefits, and travel expenses of Federal couriers along with the cost of contract air and rail shipments and the maintenance of Government-owned motor vehicles. The FY 1987 costs are estimated to be $46,900,000, and reflect an increase in the number of Federal couriers. The increase in the number of couriers is required to enhance the overall security of weapons and special nuclear material shipments.

Facilities startup and standby, and decontamination and disposition of facilities costs are anticipated to be $10,400,000 in FY 1987. The decrease is attributed to the completion of the ceramics and magnetics fabrication facility at Pinellas.

The $41,700,000 in the Miscellaneous category is required to support Federal program management, the maintenance of management information systems, SACNET operations and maintenance, planning and management studies, Nuclear Weapons Response Group, as well as a $7,554,000 change in inventories. These estimates are detailed on the following table:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Changes in Inventories		
Common Use Stores	$ 3,775	$ 4,438
Special Reactor Materials--Boron 10	- 2,369	- 692
Other Special Materials--Gold, Silver, and Platinum	3,710	3,808
Total	$ 5,116	$ 7,554
All Other		
Program Management	24,552	20,122
MIS Maintenance	7,720	6,554
SACNET	1,392	1,184
Planning and Management Studies	5,315	4,105
Nuclear Weapons Accident Response Group	2,025	2,181
Other	330	0
Total	$ 41,334	$ 34,146

Automatic Data Processing Leases

Included in the weapons production and surveillance activity is $17,360,000 for leasing automatic data processing items. Effective with FY 1987, the threshold for a major computer item has been raised from $400,000 to $1,000,000, based upon the total purchase equivalent value.

Location/Item	FY 1986 Adjusted Appropriation	FY 1987 Request
Albuquerque Operations Office, Albuquerque, NM		
General Purpose Central Processor Units (CPU's) Replacement	$ 100	$ 800
Mass Storage System	100	100
Subtotal	200	900
Bendix Plant, Kansas City, MO		
Computer Integrated Manufacturing (CIM) Production System Number 1	121	0
CPU, Memory, Channels and Upgrade	1,431	1,431
CIM Production System Number 2	1,382	1,700
CIM Production System Number 4	1,627	1,627
CIM Production System Number 6	0	1,000
Shop Floor Data Systems, Phase 4	0	500
Subtotal	4,561	6,258
Mound Plant, Miamisburg, OH		
Computer-Aided Engineering Analysis System	100	0
Technical Applications Development Analysis System	100	0
PROCODE Automated Manufacturing System	0	250
Subtotal	200	250
Pantex Plant, Amarillo, TX		
CIM Interactive Graphics System	1,700	1,200
Factory Management System	350	100
Interactive Graphics System (IGS) Computer Upgrade	0	1,000
Subtotal	2,050	2,300
Pinellas Plant, St. Petersburg, FL		
CIM System and Network, Phase I	495	0
CIM Automation	0	100
General Purpose System Replacement	0	775
Subtotal	495	875
Rocky Flats Plant, Boulder, CO		
Central Computer Replacement	1,900	1,844
CIM System Expansion, Phase 1	833	833
Subtotal	2,733	2,677
Sandia National Laboratories		
Text Editor Processor Replacement	200	400
Y-12 Plant, Oak Ridge, TN		
CIM Systems and Network, Phases 2 and 3	2,390	1,430
Central Computer Upgrade, Class IV	1,224	770
Central Facility Enhancement III	0	1,500
Subtotal	3,614	3,700
Total Automatic Data Processing Leases	$14,053	$17,360

These computers are necessary to meet the production management, process control, and numerical control activities and for administrative information processing requirements at the plants. Detailed comments follow on all new leases proposed for FY 1987.

FY 1987
Request

Bendix Plant, Kansas City, MO

CIM Production System Number 6 .... $ 1,000

The system will significantly reduce lead times to process manufacturing instructions and will improve instruction accuracy. It will allow development of standardized manufacturing methods for similar products. The system will be used for group technology/computer aided process planning which will facilitate the link between Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM). The system will be integrated into the CIM production systems which contain part definition and manufacturing data.

Shop Floor Data Systems, Phase 4 500

This will support plant-wide work-in-process reporting and production data recording in selected production departments and will improve product tracking, inventory accounting, and requirements planning. This acquisition is a continuation of the expansion of shop floor data systems to additional production departments in the plant.

Mound Plant, Miamisburg, OH

PROCODE Automated Manufacturing System 250

The FY 1987 PROCODE acquisition is an element of a phased enhancement of the automated manufacturing system. Each phase of the system will further integrate product index, production scheduling, materials planning, production manuals, and a variety of other manufacturing control activities. Such integration will minimize the manual efforts involved and save time and improve quality.

Pantex Plant, Amarillo, TX

IGS Computer Upgrade 1,000

The additional facility workload, including escalation of telecommunications requirements, will have pushed the existing IGS system to the efficiency threshold by FY 1987. This system will not only be supporting a large number of IGS work stations, but will also be supporting a balance of the plantwide classified workload. By this period, it is anticipated that additional graphic workstations, both business and technical, will be requested.

Pinellas Plant, St. Petersburg, FL

CIM Automation 100

This system is part of the total integration of Engineering and Manufacturing functions. This program involves the acquisition of advanced technology work stations/personal computers which will be available for accessing CIM systems as well as office automation functions such as spread sheet analysis, word processing, and graphics.

General Purpose System Replacement 775

Major portions of the current system will be 10 to 12 years old and reliability is less than acceptable. A new system for timesharing, transaction processing, and batch will be acquired to maintain centralized unclassified processing capability. As the unclassified load increases on the 4381-type processor acquired in FY 1985, it will be necessary to interchange its mission with this IBM 308X-type processor. This interchange of mission for the respective processor is due to the relative load forecasts for unclassified and classified data. It is planned that both machines will run the same software, permitting interchange of mission without additional conversion requirements.

	FY 1987 Request
Y-12 Plant, Oak Ridge, TN	
Central Facility Enhancement III	$ 1,500

This system is a continuation of Y-12 Central Facility equipment budgeted in prior years. This system will make available computing resources to meet the management information data storage and processing needs of the Y-12 weapons-related production facilities. This system will be used to access plant data and to meet the TRIDENT II objectives.

The request includes funding to support a Federal personnel level of 780 full-time equivalents at the following locations:

Albuquerque Operations Office	733
Oak Ridge Operations Office	33
Savannah River Operations Office	11
Total FTE's	777

	FY 1986 Adjusted Appropriation	FY 1987 Request
CAPITAL EQUIPMENT	$125,300	$132,000

The estimate for FY 1987 will provide funding for: (1) acquisition of equipment to provide a minimum capability in the production complex to meet the heavy workload; and (2) a minimum effort toward the continuing upgrading of safeguards and security capability. However, this funding level will not arrest the continuing deterioration of equipment in the production complex. The FY 1987 funding request is comprised of $17,900,000 for the purchase of computers and $114,100,000 for the acquisition of basic equipment which includes $12,394,000 for safeguards-related transportation and communications equipment.

Basic equipment	$106,050	$114,100

The increase of $8,050,000 in basic equipment funding in FY 1987 is for equipment items that are essential to halt the deterioration of the weapons production equipment base.

The transportation safeguards requirement totals $12,394,000 for FY 1987. It consists of $8,385,000 for safe and secure trailers and escort vehicles to handle the increased workload, $400,000 for the upgrade of worn ATMX railcars, $1,035,000 to maintain an effective and secure communication system, and $2,574,000 for the replacement of other operational equipment.

There is one major item of equipment: Bendix Plant - Two Centerdrive Lathes at $1,050,000 each. Bendix has the only machines of this type in the nuclear weapons complex and depends upon this capability to efficiently manufacture large case parts for the Cruise Missile, B83 Bomb, and the upcoming ASW programs. Although these machines have provided a steady performance for over 20 years, they were manufactured in 1960 and 1961 and no longer can be relied upon to support weapon schedules without extensive out-of-service periods. The original manufacturer is no longer in business and there is no commercial source for replacement parts. The existing machines will be replaced with CNC turning machines which incorporate the hollow spindle design and provide technological advantages far superior to the existing equipment. Automatic tool offset, on-machine probing, and discrete speed adjustment versus the fixed rpm settings of the current equipment will contribute to improved operations.

The purchase of new and replacement equipment for the Albuquerque Operations Office, Sandia National Laboratories, and Los Alamos National Laboratory is $13,000,000.

The remaining $86,606,000 of basic equipment funding is insufficient to halt the deterioration of equipment throughout the nuclear weapons production complex caused by substantial underfunding in recent years. The request will provide equipment restoration funds for those plants that will no longer be receiving utility and equipment restoration funding. Without adequate funding for capital equipment, the utilities and equipment restoration effort will be delayed beyond the planned nine-year program. This delay will cause uncertainties in planned workloads and delivery commitments and will ultimately increase the cost of restoration efforts.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Automatic Data Processing Equipment	$ 19,250	$ 17,900

Included in the weapons production and surveillance activity is $17,900,000 for automatic data processing items. Effective with FY 1987, the threshold for a major computer item has been raised from $400,000 to $1,000,000 based upon the total purchase equivalent value.

Location/Item	FY 1986 Adjusted Appropriation	FY 1987 Request
Albuquerque Operations Office, Albuquerque, NM		
Mass Storage System	$ 0	$ 900
Bendix Plant, Kansas City, MO		
General Purpose CPU Replacement, Phase 1	5,100	0
Facilities CAD Systems	0	1,000
Shop Floor Data Systems, Phase 3	0	2,000
General Purpose CPU Replacement, Phase 2	0	1,700
Subtotal	5,100	4,700
Mound Plant, Miamisburg, OH		
CIM Systems and Network, Phase 3	1,300	0
Additional CCF System	3,850	0
Computer Aided Engineering Analysis System	750	0
Technical Applications Development Analysis System	550	0
CIM Systems and Network, Phase 4	0	1,000
Subtotal	6,450	1,000
Pantex Plant, Amarillo, TX		
Factory Management System	0	2,500
Secured Networking Capability	0	1,050
Subtotal	0	3,550
Pinellas Plant, St. Petersburg, FL		
CIM Systems and Network, Phase 2	1,050	0
Unclassified Computer Upgrade	450	0
Subtotal	1,500	0
Rocky Flats Plant, Boulder, CO		
Data Collection Network	4,000	0
CIM Replacement System	0	2,000
Subtotal	4,000	2,000
Y-12 Plant, Oak Ridge, TN		
CIM System and Network Expansion 2	2,200	0
Central Facility Enhancement 5	0	2,550
CIM System and Network Expansion 3	0	3,200
Subtotal	2,200	5,750
Total ADP Purchases	$19,250	$17,900

These items are required to support production management for process and numerical control activities and for administrative information processing in the weapons production complex. Items proposed for acquisition in FY 1987 are discussed in the following narrative:

FY 1987
Request

Albuquerque Operations Office, Albuquerque, NM

Mass Storage System .... $ 900

This system will provide the capability for the economical gathering and storage of production data in a long-term storage media. The system will enhance the operations office's ability to meet the requirements of scheduling, monitoring, and controlling nuclear weapons production activities.

Bendix Plant, Kansas City, MO

Facilities CAD Systems .... $ 1,000

This system is additional capacity. The system will also significantly enhance the capabilities and productivity of personnel performing plant facilities, layout, space management, facilities engineering, utilities engineering, resource planning, plant maintenance, and facilities project estimating. Implementation of the computer-aided drafting system will improve drafting productivity in the Facilities, Utilities, and Engineering Maintenance organizations by at least two to one.

Shop Floor Data Systems, Phase 3 2,000

The system will support plant-wide work-in-process reporting and production data recording in selected production departments and will improve product tracking, inventory accounting, and requirements planning. This acquisition is a continuation of the expansion of shop floor data systems to additional production departments in the plant.

General Purpose CPU Replacement, Phase 2 1,700

This item will provide the necessary capacity to support the projected computing workload until FY 1988 when an additional mainframe computer is planned. This expansion will primarily consist of additional storage devices for use with the General Purpose Computer System.

Mound Plant, Miamisburg, OH

CIM Systems and Network, Phase 4 1,000

The proposed equipment represents an expansion to the plant's CIM Network. The mini-computer based information system will streamline and automate the quality control responsibilities for collecting operations data, developing statistical data analysis, and preparing formal written reports. The enhancements to the Technical Applications Development System will provide enhanced access to the system and increase the number of users by approximately 30 employees.

Pantex Plant, Amarillo, TX

Factory Management System 2,500

This system will perform planning, monitoring, and control of manufacturing processes. The system will merge bill of material listings into production documents. The system will be linked so that parts and assembly associations can be processed immediately in stores. Component receipts, issues, and returns; tester and gage control information; personnel certifications and work assignments; quality data; and scheduling information will be monitored, analyzed, and controlled through the system.

Secured Networking Capability 1,050

Secured networking capability is required to provide security control for the high speed distribution weapons information. Communications requirements between central processors, distributed processors, and communication interfaces will depend on this system. This system is required as part of the integrated nuclear weapons complex CIM wide band communications network to meet the nuclear weapons production workload.

	FY 1987 Request
Rocky Flats Plant, Boulder, CO	
CIM Replacement System	$ 2,000

This system will provide the capacity needed to accommodate solids modeling, finite element analysis, and over fifty design stations for TRIDENT II and MX production. Capacity requirements analyses have been conducted which confirm the requirement for this acquisition. In addition, there is a requirement to provide redundant large scale computing capability and backup computing facilities.

Y-12 Plant, Oak Ridge, TN

Central Facility Enhancement 5	2,550

This system constitutes the purchase of a central file storage system and associated CPU and communications equipment and interfaces to support the full implementation at Y-12 of the DOE CIM Nuclear Weapons Network and the plant's internal data and information storage needs. This system will provide adequate control for the electronic interchange of data with other nuclear weapons facilities, eliminating the manual processes now in place and the delays inherent in such operations.

CIM Systems and Network Expansion 3	3,200

The equipment will be employed to increase productivity, decrease long-term capital and operating expenditures, and minimize personnel requirements for increased production schedules. The system will provide computer-aided process planning, procedure generation, and automatic collection and distribution of critical manufacturing and certification information. The system will enhance the plant's ability to provide production and certification of weapons components, associated design and fabrication functions, and other support activities to keep pace with technological demands created by advanced weapon systems design and experimentation.

	FY 1986 Adjusted Appropriation	FY 1987 Request
CONSTRUCTION	$ 420,864	$ 401,700

Following is a table listing the construction items included in the FY 1987 production and surveillance budget. Detailed description and justification information for each project is presented in the construction project data sheets.

Project Numbers	Title	TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
New Projects				
87-D-121	General plant projects, VL	$ 32,000	$ 0	$ 32,000
87-D-122	SRAM II warhead production facilities, VL	55,000	0	5,000
87-D-123	Protective clothing decontamination facility, Rocky Flats	5,200	0	500
87-D-127	Environment, safety, and health upgrade, Mound	4,300	0	2,400
87-D-130	Receiving and shipping facility, Pinellas	2,700	0	300
	Total new projects		$ 0	$ 40,200

Project Numbers	Title	TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
Prior-Year Projects				
86-D-121	General plant projects, VL	$ 28,700	$ 28,700	$ 0
86-D-122	Structural upgrade of existing plutonium facilities, Rocky Flats	5,600	2,820	2,600
86-D-123	Environmental hazards elimination, VL	39,000	7,240	18,300
86-D-124	Safeguards and site security upgrading, Phase II, Mound	5,000	1,880	3,000
86-D-125	Safeguards and site security upgrading, Phase II, Pantex	10,000	1,410	8,500
86-D-130	Tritium loading facility replacement, Savannah River	120,000	4,700	30,000
85-D-112	Enriched uranium recovery improvements, Y-12 Plant,	52,000	12,500	21,800
85-D-113	Power plant and steam distribution system, Pantex	27,200	12,690	7,600
85-D-115	Renovate plutonium building utility systems, Rocky Flats	35,100	16,640	14,500
85-D-121	Air and water pollution control facilities, Y-12 Plant	29,000	13,160	10,000
85-D-123	Safeguards and site security upgrade, Phase I, Pantex	5,000	2,820	1,000
85-D-124	Safeguards and site security upgrade, Phase II, Rocky Flats	3,260	2,260	0
85-D-125	Tactical bomb production facilities, VL	35,800	9,000	14,800
84-D-112	TRIDENT II warhead production facilities, VL	158,500	60,700	14,500
84-D-113	Antisubmarine warfare/standoff weapon warhead production facilities, VL	125,700	5,000	47,000
84-D-115	Electrical system expansion, Pantex	14,480	5,920	0
84-D-117	Inert assembly and test facility, Pantex	13,280	5,080	0
84-D-118	High explosive subassembly facility, Pantex	40,000	31,020	0
84-D-120	Explosive component test facility, Mound	21,300	7,710	0
84-D-124	Environmental improvements, Y-12 Plant	45,400	11,280	10,000
84-D-211	Safeguards and site security upgrading, Y-12 Plant	68,000	12,220	30,000
84-D-212	Safeguards and site security upgrade, Pinellas	7,500	4,370	1,000
82-D-107	Utilities and equipment restoration, replacement, and upgrade, Phase 3, VL	1,042,000	152,250	116,900
82-D-109	155mm Artillery Fired Atomic Projectile (AFAP) production facilities, VL	40,000	15,000	10,000
82-D-111	Interactive graphics systems, VL	22,000	4,230	0
	Total prior-year projects		430,600	361,500
	General Reductions and Management Initiatives		- 9,736 a/	0
	Total production and surveillance		$420,864	$401,700

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a/ $1,000,000 was applied to new budget authority on Project 84-D-120, making general and Management Initiative reductions of $10,736,000.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Program Direction	$95,100	$60,550
OPERATING EXPENSES	95,100	60,550

Included within the Weapons Program Direction request is funding to support the following areas:

- Office of the Assistant Secretary for Defense Programs
- Deputy Assistant Secretary for Military Application
- Albuquerque Operations Office
- Nevada Operations Office
- Community Assistance Program at Los Alamos, New Mexico

Office of the Assistant Secretary for Defense Programs (OASDP)

The Office of the Assistant Secretary for Defense Programs provides overall direction and administration of Defense Programs activities to assure that operations are conducted in the most efficient manner consistent with Defense Programs mission objectives. Some specific support functions carried out by this office include:

- overall management of activities related to the accomplishment of the Defense Programs mission;
- advising the Secretary of Energy on national security matters;
- providing senior management program direction and guidance;
- coordination of the development of Defense Programs plans and budgets;
- review of congressional proceedings and legislation impacting Defense Programs and development and coordination of Defense Programs congressional testimony preparation and presentation;
- providing the Assistant Secretary with information regarding the effectiveness of national security nuclear weapons development and production activities;
- management of the long-range planning process of the laboratories and Defense Programs participation in the Department's Institutional Planning Process;
- management of Defense Programs manpower utilization and allocation function;
- development, implementation, coordination, and management of the Assistant Secretary's policy analysis program;
- reviewing, coordinating, commenting on, and making recommendations on Department of Energy activities, orders, and reports that affect Defense Programs management and planning;
- exercising responsibility for the energy and utility management program within the Defense Programs complex, maintaining cognizance over field office/contractor energy/utility management activities, and maintaining contacts with the Department of Energy's energy organization;
- oversight of the safeguards and security policy and protection programs of the Department of Energy; and
- analyses of the effectiveness of safeguards and security systems through a process of inspection, evaluation, assessment, and recommendations to the Assistant Secretary for Defense Programs concerning findings that are significant to the management of Defense Programs activities.

Office of the Deputy Assistant Secretary for Military Application

Program management and support functions performed by the Office of Military Application and the Office of Inertial Fusion personnel in support of the overall objectives of the weapons program and the inertial fusion program include:

- program management, direction, and support;
- development of program goals and objectives;
- monitoring, evaluation, and approval of mainline research efforts at the weapons laboratories;
- formulation of plans and budgets for program accomplishment;
- presentation and defense of the proposed budgets to the President and the Congress;
- conduct of studies, analyses, and evaluations to assure proper program accomplishment;
- coordination of programs with other field offices, Federal agencies, the Office of Management and Budget, Congress, and numerous contractors;
- management of the nuclear weapons complex in an effective and efficient manner; and
- execution of plans and directives for development and production of nuclear weapons.

Albuquerque Operations Office (AL)

The Albuquerque Operations Office's primary goal is to continue the effective management and oversight of the weapons research, development, and production programs. An integral part of this effort is the coordination and integration of weapons program activities at Sandia National Laboratories, the Los Alamos National Laboratory, and the Lawrence Livermore National Laboratory; weapons production contractors consisting of Rockwell International, Mound Plant, General Electric Corporation, Mason and Hanger-Silas Mason Company, Inc., and the Bendix Corporation; and the participation of Oak Ridge and Savannah River Operations Offices in assigned portions of the weapons production program. Other goals are the safe transport of all government-owned strategic quantities of special nuclear materials and the effective management of all assigned program and project activities including energy and nonweapons programs. To accomplish these goals, AL requires a Headquarters operation, seven satellite area offices, and two support offices within the Continental United States.

AL's major objectives are the successful execution, through Federal personnel and contracting, of assigned programs for manufacturing, quality assurance, safety, and transportation of nuclear weapons; the planning, scheduling, distribution, and transportation of all shipments of government-owned strategic quantities of special nuclear materials and other toxic nuclear materials not related to the weapons program and not covered by Nuclear Regulatory Commission license; and the management of assigned energy-related and nonweapons programs. AL has been assigned lead mission responsibilities for the weapons production and surveillance program. Together with nuclear research, development, and testing at Sandia and Los Alamos National Laboratories, AL and its production contractors perform the major role in the Department's defense programs.

To carry out their assigned mission, AL uses the services of government-owned, contractor-operated facilities located throughout the United States, employing more than 30,000.

Nevada Operations Office

The Nevada Operations Office is responsible for managing the Nevada Test Site, currently the only area in the United States approved for underground nuclear testing. This responsibility consists of providing the Government-owned facilities site engineering, construction, and logistical support for conducting nuclear testing. These objectives are accomplished by the utilization of a small cadre of Federal employees who provide management oversight of the work being performed by contractor personnel.

Community Assistance Program

The Department of Energy administers the Community Assistance Program under Section 91 of Public Law 94-187, the Atomic Energy Community Act of 1955, as amended, to provide assistance to specified units of local government in the community associated with the Los Alamos National Laboratory. The purpose of the assistance is to: (a) compensate the Los Alamos community for its lack of an industrial or commercial tax base; (b) attract and retain employees at the Federal energy facilities; and (c) assist in achieving financial independence. The Department of Energy has implemented Section 91 by entering into five-year contracts with Los Alamos County and the Los Alamos County School Board, utilizing the funding formula adopted in 1979 by the Department of Energy Working Group on Community Assistance. To insure satisfaction of the statutory requirement that the community makes full use of its own resources, the Department has entered into an agreement with the Los Alamos County to finance projects designed to reduce the long-term dependence on assistance from the Department of Energy. This financing is in the amount of 5 percent of the assistance payments computed by the contract formula for Los Alamos County, to be matched by equal amounts from the recipients. The FY 1987 budget assumes that all commitments to the Oak Ridge Community under the provision of Section 91 of the Atomic Energy Community Act of 1955 have been fulfilled through the lump-sum payment of $35,000,000. No further payments will be made to the Oak Ridge Community.

Program Direction Funding Requirements

The total operating funds, which provide for the salaries, other personal services, benefits, travel expenses, and contractual services for 838 full-time equivalents, plus assistance payments to the Los Alamos Community, are presented in the following table:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Office of the Assistant Secretary for Defense Programs	$ 4,784	$ 7,600
Office of the Deputy Assistant Secretary for Military Application	5,415	5,860
Albuquerque Operations Office	27,620	29,745
Nevada Operations Office	8,436	9,250
Community Assistance Program - Los Alamos	7,712	8,095
Community Assistance Program - Oak Ridge	41,133	0
Total	$95,100	$60,550

These funds provide for the salaries, other personal services, benefits, travel expenses, and contractual services for the following levels of Federal employees:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Office of the Assistant Secretary for Defense Programs	59	68
Office of Deputy Assistant Secretary for Military Application	105	105
Albuquerque Operations Office	517	517
Nevada Operations Office	145	148
Total	826	838

Federal Manpower Funding

Funding associated with the requested positions for salaries and other personal services, benefits, and travel is outlined below:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Office of the Assistant Secretary for Defense Programs	$ 2,796	$ 3,900
Office of the Deputy Assistant Secretary for Military Application	5,305	5,710
Albuquerque Operations Office	22,957	23,476
Nevada Operations Office	6,715	7,090
Total	$37,773	$40,176

A summary by object class follows:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Salaries and other personal services	$30,653	$32,381
Benefits	4,268	4,595
Travel	2,852	3,200
Total	$37,773	$40,176

Contractual Services

Funding is also included for those contractual services and supplies necessary to support the annual administrative requirements for operations at the following locations:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Office of the Assistant Secretary for Defense Programs	$ 1,988	$ 3,700
Office of the Deputy Assistant Secretary for Military Application	110	150
Albuquerque Operations Office	4,663	6,269
Nevada Operations Office	1,721	2,160
Total	$ 8,482	$12,279

The major portion of the requested increase is attributable to the Inspection and Evaluation Program that is the responsibility of the Office of the Assistant Secretary for Defense Programs. Contractual services are a necessary and critical element of the Inspection and Evaluation operation. These funds enable the necessary technical assistance for planning and conducting the highly visible and necessary inspections of DOE field offices and related facilities. The inspections are required in order to evaluate the effectiveness of safeguards and security within the DOE community. In order to provide the expert consultants from the various disciplines necessary to conduct the inspections, $2,100,000 will be required. Additional technical support and laboratory services for inspections are also required.

In addition, $1,600,000 is requested in FY 1987 to provide support services in the areas of information systems planning, automated office support services, graphics support, and other special analytical tasks. It is also necessary to purchase automated office support workstations. At Headquarters, $150,000 is allocated for personnel training requirements and certain other miscellaneous expenses such as graphics, printing, leased equipment, and contractual computer programming services.

At the Albuquerque Operations Office, with the exception of communications and utilities, all other supplies, materials, and services were escalated at seven percent, communication costs were escalated at fourteen percent, and utilities were escalated at ten percent. Mountain Bell services have increased in connection with circuit lines from Kirtland Air Force Base to the Los Alamos National Laboratory. This cost is for a monthly lease of a wideband circuit to provide voice and data circuits in support of the weapons program activities between the Albuquerque Operations Office and the Los Alamos National Laboratory. Additional contracting out of support services such as security escort service, word processing, and ground maintenance will occur in FY 1986 and FY 1987. In FY 1986 and FY 1987, $300,000 is included for the DOE Telecommunications operational models (OPMODEL). This provides funding for AL's share of the lease and maintenance costs of the earth stations and terrestial circuits.

At the Nevada Operations Office, utilities will be 20 to 25 percent higher because of the increase of square footage charged to DOE. The local power company has been awarded a rate increase by the Public Service Commission. Also, telephone charges have increased due to the installation of a new telephone system and FTS charges are higher because of the deregulation and divestiture of AT&T. Printing and reproduction is provided by contractors. Jobs which exceed Nevada's capabilities are sent to the Mercury, Nevada Printing Plant. Considering inflation and other cost increases which may occur, an 8 to 10 percent increase is anticipated. Other areas that are funded under contractual services are janitorial and custodial services, computer services, guard services, word processing services, and maintenance of equipment.

JUSTIFICATION FOR COMMUNITY ASSISTANCE PAYMENTS

The requested level of funding for the Community Assistance Program will support the Department's obligations under assistance contracts with the Los Alamos entities as follows:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Los Alamos		
Civic Activities	$ 30	$ 30
County:		
Assistance Payments	2,116	2,221
Schools--Assistance Payments	5,566	5,844
Subtotal	7,712	8,095
Oak Ridge		
Assistance Payments:		
City of Oak Ridge	22,254	0
Anderson County	9,512	0
Roane County	9,367	0
Subtotal	41,133	0
Total	$48,845	$ 8,095

The estimate of $30,000 for civic activities at Los Alamos is requested to cover the cost of maintaining Federal facilities located in the community. The requested amounts for assistance payments will fund the Department of Energy's obligation, as determined in accordance with the formula described in the contracts with the county and the schools, based on the provisions of the Atomic Energy Community Act of 1955, as amended. The financial assistance estimates are derived by a formula recommended by the Department of Energy Working Group on Community Assistance.

All commitments to the Oak Ridge Community under the provision of Section 91 of the Atomic Energy Community Act of 1955 have been fulfilled through the lump-sum payment of $41,133,000. No further payments will be made to the Oak Ridge Community.

JUSTIFICATION FOR INCREASE IN FEDERAL MANPOWER

The requested increase of 12 full-time equivalent Federal personnel includes the following:

Office of the Assistant Secretary for Defense Programs	9
Nevada Operations Office	3
Total	12

Office of the Assistant Secretary for Defense Programs

Ten additional full-time equivalents in the Office of the Assistant Secretary for Defense Programs are required to adequately support the enhanced inspection and evaluation activity. The increasing number of performance-oriented inspection topics, together with the expansion of both depth and scope of effectiveness exercises, have contributed to the increased staffing requirements. The rate of reinspections has increase, and there are contractor oversight responsibilities associated with the inspection and evaluation support.

Nevada Operations Office

Three additional FTE's are requested as follows:

Contracts and Procurement Division

Due to Nevada staff becoming more responsible for high dollar value procurement rather than contractor actions, since these would be taxable, an additional contract management position is required in the Contracts and Procurement Division.

Finance Division

Because of the increasing policy and procedures requirements issued in the new Presidential Procurement and Accounting Initiative, two additional positions are requested in the Finance Division. This Division reviews, evaluates, and recommends proper procedures to assure compliance with these new regulations.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: General plant projects, various locations
2. Project No.: 87-D-101
3. Date A-E work initiated: 1st Qtr. FY 1987
3a. Date physical construction starts: 1st Qtr. FY 1987
4. Date construction ends: 4th Qtr. FY 1989
5. Previous cost estimate: None
Date:
6. Current cost estimate: $29,000
Date: 1/86

7. Financial schedule

		Costs			
Fiscal Year	Obligations	FY 1985	FY 1986	FY 1987	After FY 1987
Prior to FY 1985	$ 0	$12,777	$ 5,255	$ 1,658	$ 0
1985	26,500	5,818	9,850	10,832	0
1986	27,900	0	8,400	11,200	8,300
1986 Sequestered	(400)	(0)	(400)	(0)	(0)
1987	29,000	0	0	8,700	20,300

8. Brief physical description of project

This project provides for general plant improvements involving minor new construction. The work to be performed will include such activities as construction or roads, utilities, minor structures, capital alterations and additions, and technical facilities required for the operation of weapons program installations.

This project covers requirements of the weapons research and development facilities (Los Alamos National Laboratory, the Lawrence Livermore National Laboratory, and the Sandia National Laboratories (SNLA and SNLL)), and the nuclear weapons testing facilities (the Nevada Operations Office and its contractors).

9. Purpose, justification of need for, and scope of project

A general plant project (GPP) is necessary to meet new and changing program developments, to correct deficiencies, and for minor utility and road construction. Research developments and changes in technical program requirements frequently result in the need for altered or new construction items not previously anticipated. In the past, these changes have included building alterations or additions to house new equipment for research, development, and testing functions; construction of new small buildings; extensions or modifications to utilities; and general area development.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

The weapons GPP estimate for FY 1987 of $29,000,000 provides the level of effort essential to meet the existing programmatic requirements, requirements for maintenance and replacement due to the aging of the plant facilities and utilities, and other capital facilities. Adequate levels of GPP funding are essential to halt the ongoing deterioration of the capital base. A large backlog of critically required GPP currently exists and continues to grow because of past underfunding in this area. The FY 1987 request represents the minimum level of funding to support general plant requirements.

The following subprojects are only examples of items of work which may be performed at the major locations covered under this project. These are grouped by location and under the following reason-of-need categories: Health, Fire, and Safety; Programmatic Needs; Pollution Abatement; Maintenance; Safeguards and Security; and Other.

The preliminary estimate of FY 1987 requirements by major area is as follows:

Weapons Research and Development	
Los Alamos National Laboratory	$ 7,100
Lawrence Livermore National Laboratory	7,100
Sandia National Laboratories	7,100
Nuclear Weapons Testing	
Nevada Operations Office	7,700
Total	$29,000

Los Alamos National Laboratory .... $ 7,100

(1) Health, Fire, and Safety

a. Fire Protection Improvements .... $ 900

This work consists of providing and installing automatic suppression system in building at various laboratory sites. This work is needed to comply with Life Safety and OSHA regulations.

Subtotal - Health, Fire, and Safety .... $ 900

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(2) Programmatic Needs

a. Data Processing Interpretation Building .... $ 550

This project will provide a building, with related utilities and finished interior, to house an 800-square foot vault for the Los Alamos radiochemical data on nuclear tests. Recent expansion of mass spectrometry application to new detectors and future expansion into gas diagnostics requires this additional space for data handling.

b. Gas Analysis Laboratory .... $ 700

This project will provide a facility for rare-gas analysis. This is a new effort in direct support of the weapon test program to measure thermonuclear yield of underground tests.

c. HE Contaminated Trash Incinerator .... $ 200

This new incinerator will be used to dispose of HE contaminated trash generated in the S-Site exclusion area. The construction will consist of a screened superstructure on a concrete burn pad with access roads for dumping and cleanout activities.

The existing incinerator needs extensive repairs and is difficult to clean.

d. Magazines, Explosives Storage .... $ 150

The current load capacity for explosives storage has caused a problem with redistribution of the load limits. This project will provide two unheated magazines for large explosive-storage to accomodate increased usage by pre-Phase 3 and Phase 3 weapons programs.

Subtotal - Programmatic Needs .... $ 1,600

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(3) Pollution Abatement

a. Pit Exhaust System .... $ 100

This project will install a new High Efficiency Particlate Air (HEPA) filter plenum with a 30-foot stack for a large covered pit containing storage tanks for process waste. Presently, the HEPA filter plenum is located in the pit and filtered radioactive contaminants discharge at ground level next to a parking lot. This will provide personnel using the parking area sufficient protection from exposure to unfiltered exhaust.

Subtotal - Pollution Abatement .... $ 100

(4) Maintenance

a. Heating System Modification .... $ 650

A new heating system will replace the existing system which has deteriorated to the point of providing inadequate temperature control for machining and forming explosives. This new system will be equipped with control valves, coil units, and room thermostats for each machine and control room throughout the building.

b. Underground Steam and Condensate Line Replacement .... $ 350

This project will replace approximately 4,000 lineal feet of steam and condensate lines, insulation, and condensate pumps which have deteriorated. The steam from these lines is used for processing materials as well as heating the facilities. Frequent leaks in these lines have an adverse effect on the operation and costs of the site.

c. Heavy Equipment Shop Addition .... $ 600

The current shop was not designed or constructed for heavy equipment maintenance and repair. This building addition will include skylights over maintenance bay areas, a forced-air heating system, a ventilation system, work area outlets, lighting, and an overhead crane for engine removal. This addition will increase productivity and operational efficiency for repair and maintenance of heavy equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

d. Automatic Vehicle Wash .... $ 250

This project would provide for an automatic vehicle wash which would include an undercarriage wash, rust inhibitor, and a water-recovery system. Currently 12 vehicles are washed per day; this new facility would wash 80 vehicles per day. The improved service would reduce vehicle rust, improve maintenance, and should prove cost effective.

e. Palletized Material Storage .... $ 150

This project will construct an enclosed three-sided building to store palletized material. Currently, the warehouse is overcrowded and the overflow of the palletized materials is being stored outdoors making them vulnerable to the elements.

f. Electrical Upgrade .... $ 300

This project will replace a substation and associated electrical item such as transformers, breakers, and motor control centers serving one of the radiochemistry buildings. This electrical equipment is old and outdated, which increases maintenance costs and decreases its reliability.

g. Electrical Distribution System .... $ 600

This project will begin to replace and/or upgrade electrical distribution systems at various locations throughout the Laboratory. The old and obsolete equipment to be replaced includes switchgear, motor control centers, dedicated site control circuits, and associated wiring and conduit. Facilities and programmatic operations are affected due to lack of additional power and unreliable distribution equipment.

Subtotal - Maintenance .... $ 2,900

(5) Other

a. Printing and Photocomposition Plant .... $ 750

This facility will house the printing and photocomposition Laboratory-wide support service. Due to increased publication activities at the Laboratory and the addition of state-of-the-art equipment, the printing and photocomposition activities have become extremely overcrowded, creating an unsafe working environment. This support service plays a major role in Laboratory operations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

b. Two-story Office Building .... $ 850

This project will construct a building to house personnel from the Theoretical Division. Due to overcrowded working conditions, staffing has been difficult and University senior scientists have been denying visitors because of the lack of work space. This Division's missions have been severely affected.

Subtotal - Other .... $ 1,600

Lawrence Livermore National Laboratory .... $ 7,100

(1) Health, Fire, and Safety

a. Air Intake and Exhaust .... $ 200

This project will install a ventilation system that will prevent fume hood exhausts from re-entering through the air intake in the Chemistry Building.

b. Fire Sprinkler System .... $ 500

Several buildings will have fire sprinkler systems installed. This will prevent a significant loss of property should a fire occur.

c. Berms and Asphalt Surfaced Yard Area .... $ 200

This project will construct berms and an asphalt surfaced yard area of approximately 45,000 square feet to contain any accidental leakage of stored toxic waste liquids.

Subtotal - Health, Fire, and Safety .... $ 900

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations	2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(2) Programmatic Needs

a. Mechanical Technician Shop Addition .... $ 200

This addition will provide space for machine tools and an area for receiving and temporary storage. This facility has experienced a dramatically increased workload that has created an overcrowded condition in the technicians' shop and receiving area.

b. Administrative Computer Center .... $ 700

This project will add an addition to an existing building to house a new computer system. The interior floor construction would consist of a standard computer room sub-floor covered by raised floor tiles. Also included would be sprinklers, smoke and fire detection systems, and under floor water detection.

c. Optics Storage and Test Facility .... $ 970

This project would consist of a pre-engineered metal "Butler" type building. There is a need for an Optics Facility for the storage and testing of optical components.

d. Plating Development Laboratory .... $ 700

This project is a two-story addition to the Plating Shop. It will provide space for an experimental plating development laboratory with a prototype development area, a test and evaluation area, a photo-chemical machining room, and a quality control area. This facility is needed to satisfy programmatic requirements such as electroforming small pin holes for diagnostic devices used in nuclear tests, electroform copper-gold alloys, solid state bonding of unusual metals using electro-deposited coatings, and other plating experimental projects.

e. Electronic Microfabrication Facility .... $ 980

A new building to house the electronics microfabrication activities will be built. The activities are currently housed in several locations. The consolidation would improve the environmental conditions and efficiency.

Subtotal - Programmatic Needs .... $ 3,550

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(3) Maintenance

a. Reconstruct South Entrance Drive .... $ 700

This project will reconstruct the South Entrance Drive from the guard gate kiosk to the inner loop road. The existing roadway does not have the structural support necessary to provide satisfactory service for vehicles without constant repairs.

b. Chiller Upgrade .... $ 400

The existing chiller unit in the main machine shop will be replaced with a larger capacity chiller and modify the piping system. The increased fabrication requirements have exceeded the capability of the present system.

Subtotal - Maintenance .... $ 1,100

(4) Other

a. Communication Ducts .... $ 800

This project will install 3,000 feet of underground ducts to the North East area for telephone and data communication. All other ducts to this area are filled to capacity.

b. Feeder Substation, East Area .... $ 750

New electrical ducts, manholes, and cables will be installed from the main substation to the new switchgear. This will provide necessary electrical power requirements for the area.

Subtotal - Other .... $ 1,550

9. Purpose, justification of need for, and scope of project (contd.)

Nevada Operations Office .... $ 7,700

(1) Health, Fire, and Safety

a. Respirator Facility, Area 6 .... $ 550

This project will provide a prefabricated metal building containing a large shop area for servicing and storing respiratory protective equipment. The existing facility is too small for current operations.

Subtotal - Health, Fire, and Safety .... $ 550

(2) Programmatic Needs

a. Geophysical Logging Support Facility .... $ 990

This project will construct a pre-engineered metal building with varying eave heights. It will be equipped with a heavy duty overhead crane for manipulating logging tools and special equipment. Laboratory and office space also will be provided.

b. Install Backup Chiller, CP-1 .... $ 330

This project will provide a backup 100-ton centrifugal water chiller in the basement of CP-1. This backup will prevent loss of air-conditioning to electronic and computer equipment when a breakdown occurs or maintenance is required.

c. Rad-Safe Storage Facility, Area 6 .... $ 250

This project will provide a centralized storage area for radiological equipment and supplies used in Area 6. The consolidation of several smaller, scattered storage areas will provide a more efficient operation.

d. Building Modifications, Area 23, Mercury .... $ 330

This project provides additional refrigerated food storage adjacent to the cafeteria storeroom. Due to increased customer counts, additional refrigerated storage is required tc improve inventory and quality assurance controls, reduce waste, and ensure proper food rotation.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations
2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

e. Cable Testing Facility, Area 23 .... $ 750

This project provides a building for cable inspection and testing, and fiber optics laboratory. The existing facilities consist of old delapidated trailers and a prefabricated metal building. This will centralize their functions for improved safety and operation.

Subtotal - Programmatic Needs .... $ 2,650

(3) Pollution Abatement

a. Sewage System Modification, Area 6 .... $ 580

This project will provide four sewage lagoons for the treatment of sanitary wastes. The existing system has become inadequate with increased usage, and there is insufficient room for its expansion.

b. Sewage System Modification, Area 12 .... $ 840

This project will construct four sewage lagoons (larger than those for Area 6) for the treatment of sanitary wastes. The existing system can no longer meet the demand, and there is insufficient room to expand it.

Subtotal - Pollution Abatement .... $ 1,420

(4) Maintenance

a. Water Distribution Upgrade, Area 12 .... $ 600

This project will replace 17,500 feet of deteriorated 4-inch diameter pipe. The replacement of the existing line will insure an adequate water supply for Area 12.

b. Water Storage, Area 6 .... $ 350

A new 500,000 gallon storage tank will ensure a continuous water supply while the existing tank is being repaired, thus serving as a backup and providing for increased storage capacity.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

c. Water Storage, Area 12 .... $ 380

This project provides a 500,000 gallon storage tank for increased storage capacity in the Area 12 and Area 2 water supply system.

Subtotal - Maintenance .... $ 1,330

(5) Safeguards and Security

a. Security Upgrades and Fences, CP-1 Complex, Area 6 .... $ 900

This construction project is to upgrade the security facilities with an improved and expanded fence; inclusion of CP-40 and the aerial response facility within the security area; and provision for alarm, closed-circuit television, and improved lighting systems.

b. Device Systems Building .... $ 850

This facility will provide a classified area for the assembly and pre-alignment of the device system pedestal and auxiliary system canister. The increased event capacity of the ATLAS facility has required the device system assembly area to handle twice its current capacity.

Subtotal - Safeguards and Security .... $ 1,750

Sandia National Laboratories .... $ 7,100

(1) Programmatic Needs

a. New Security/Emergency Control Center, Area V, SNLA .... $ 600

This project will replace an existing guard building erected over 20 years ago. The building serves two main functions--the entry and exit control point for personnel and vehicles and the Area V emergency control center. The current building is congested and is entirely too small for emergency operations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

b. Linac Facility, SNLL .... $ 1,000

This project will construct a building to house the 9 MEC Linear Accelerator. It is needed for nondestructive testing to support weapon component development and weapon testing.

c. Environmental Chamber Facility, SNLL .... $ 1,000

An environmental test building is required to house new improved environmental chambers. The new chambers will provide greater test ranges and more precise control to support the stringent test requirements for weapons system components.

d. Emergency Generator Building, Tonopah Test Range (TTR) .... $ 500

This project will replace an inadequate 25-year-old building and improve the backup power system for the TTR Control Point area. It would include a second 500KW diesel-powered generator and modern switching and control equipment. The building will also house the pumps and other equipment for the Control Point fire protection system.

e. Library Addition to an Existing Building, SNLA .... $ 1,000

This project will provide a needed addition to the building. This addition will provide space to consolidate scattered collection, to expand the reports section, and space for computing equipment to be used for automation of library services.

Subtotal - Programmatic Needs .... $ 4,100

(2) Maintenance

a. Maintenance/Test Support Building, SNLA .... $ 1,000

This building will permit the consolidation of personnel, facilities, and functions presently fragmented over a wide geographical area in Tech Area 111. There are currently about 100 employees located in approximately 25 structures, many of which are temporary. Lack of adequate space has resulted in the conduct of some operations outside, without protection from adverse conditions. This fragmentation creates problems for material, control, protection, and

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations
2. Project No.: 87-D-101

9. Purpose, justification of need for, and scope of project (contd.)

security. The existing permanent structures could be used by test operations and various support activities, while the temporary structures would be dismantled.

Subtotal - Maintenance .... $ 1,000

(3) Other

a. Area 1 Master Unit Substation, SNLA .... $ 1,000

This substation is required to provide power to new buildings and to relieve overloaded conditions on the existing substations and their feeders.

b. Area 1 Sanitary Sewer East Site, SNLA .... $ 1,000

This project will construct a relief sanitary sewer system for Tech Area 1. The laboratory facility expansion for the last ten years has overtaxed the existing system which is over 30 years old.

Subtotal - Other .... $ 2,000

10. Details of cost estimate

a. Engineering, design, and inspection ....)	
b. Land and land rights ....)	$29,000
c. Construction costs ....)	
d. Contingencies ....)	
Total estimated cost	$29,000

11. Method of performance

To the extent feasible, design and inspection will be performed under negotiated lump-sum architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids. In some instances, it will be more economical or timely for design, inspection, procurement, or construction to be done by operating contractors and others already under contract to the Government.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations	2. Project No.: 87-D-101

12. Funding schedule of project funding and other related funding requirements

Not applicable.

13. Narrative explanation of total project funding and related funding requirements

Not applicable.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and location of project: Environmental compliance and cleanup,
Lawrence Livermore National Laboratory
Livermore, California, and Site 300, California

2. Project No.: 87-D-102

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3. Date A-E work initiated: 1st Qtr. FY 1987

3a. Date physical construction starts: 3rd Qtr. FY 1987

4. Date construction ends: 3rd Qtr. FY 1991

5. Previous cost estimate: None
Date: N/A

6. Current cost estimate: $134,000 a/
Date: 1/86

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7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 7,000	$ 7,000	$ 7,000	$ 7,000
1988	25,000	25,000	25,000	20,000
1989	44,000	44,000	44,000	40,000
1990	40,000	40,000	40,000	44,000
1991	18,000	18,000	18,000	23,000

65

8. Brief physical description of project

This Lawrence Livermore National Laboratory (LLNL) Environmental Compliance and Cleanup (ECC) project supports a series of investigations, assessment tests, extensive remedial actions, some facility design/construction and environmental quality monitoring and verification, all aimed at cleaning up the site's environment and achieving compliance with various environmental regulations at the LLNL two sites, the Livermore Laboratory Site and Site 300. It is different from a normal facility project and contains extensive nonfacility activity.

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a/ Some of the estimated cost items (such as certain facility design/construction items) have relatively small contingencies and should be close to their actual costs. However, environmental assessments and cleanup operations cannot be accurately estimated and even a large contingency may turn out to be inadequate. The first year FY 1987 has a firm budget of $7,000,000, but the cost uncertainty for the remaining four years increases each year. The total estimated cost of $134,000,000 is a five-year planning estimate. The first year funding will permit completion of the highest priority assessments and begin critical remedial actions. At the end of this period, a better estimate of the remaining effort and cost can be made.

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8. Brief physical description of project (contd.)

There are four major tasks in which work will be performed by this project. They are:

a. Investigative/Assessment
b. Facilities Design and Construction
c. Environmental Corrections, Cleanup and Abatement
d. Monitoring

These tasks will be applied to seven distinct activities in which LLNL is either in violation of or must act to prevent the contamination of the environment. These activities are:

1. Underground and Surface Water
2. Soil Contamination
3. Landfills
4. Liquid Waste Discharges
5. Underground Tanks
6. PCB Filled Electrical Equipment
7. Reactor Decommissioning

Several contamination assessments, and control or remediation efforts are under evaluation at the present time at LLNL to satisfy existing urgent requirements. These activities will be used to determine some of the future remedial action to be implemented under this project. For those tasks in this project, where the nature and extent of the contamination is well enough understood to determine the corrective steps, this project provides not only for the completion of the assessment but also for the required cleanup or remedial actions. This project also provides for further assessment of those areas which have not yet been adequately defined and others which have the potential for, but less probability of, contaminating the environment.

The laboratory must pursue this project under the watchful purview of a large number of Federal, state, and local environmental regulatory agencies. To satisfy the demands of the regulators, this project must address and balance the requirements both to cleanup vigorously existing contamination and to assess energetically sites of potential contamination.

The degree of remedial action required to comply (for some of the segments of this project) is dependent on data from assessments currently underway (or planned for FY 1985 and 1986), as well as on newly enacted legislation for which implementing regulations are still being developed (e.g., underground tanks).

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a. Investigation/Assessment

The first task to be accomplished on each of the seven areas of contamination is to determine accurately the extent of contamination.

(1) Underground and Surface Waters.

The most urgent priority will be given to complete the environmental assessments that have already been initiated and start on the cleanup of areas known to be contaminated; they are a gasoline spill at the Livermore Site, the aquifer in areas adjacent to the Lawrence Livermore and Sandia Livermore Sites, and an area at Lawrence Livermore Site 300. Significant trichloroethylene (TCE) contamination has been identified in the ground water underneath the Livermore Site and also underneath adjacent properties. The source of this contamination is currently under investigation. It was this contamination that lead the Environmental Protection Agency (EPA) to nominate the Laboratory for the National Priority List of Contaminated Sites that need urgent correction. Continuing assessments will include drilling diagnostic wells to determine the location, concentration, migration, and types of contamination through sample analysis and geological analyses. There are at least four additional locations which are strongly suspected to have contaminated aquifers. When the urgent priority sites have been assessed, these will be investigated. As a part of this initial work, a feasibility study will be undertaken to evaluate several alternate options for cleaning of the underground water at the Livermore Site, including a possible central water treatment facility for cleaning waters extracted from several areas.

(2) Soil Contamination

The sources of soil contamination date back more than four decades, when the present Laboratory Site was a Naval air base. The principal objective of this activity will be to assess and cleanup all areas of known and suspected soil contamination by deposition of hazardous waste on the land surface. This includes liquid spill sites, particulate solid deposits, former suspected slurry ponds or inactive, undiscovered former landfills.

There are two tasks: The first concerns the completion of the assessments of two locations (most of which already have been started) that are strongly suspected to have contaminated soils. Sampling will be done to identify and quantify the contaminants. The second task concerns the assessment of a number of additional locations that may have soil contamination; however, these locations have not been sampled or as yet assessed. A historical site survey has identified about 24 such locations.

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(3) Landfills

For the past 30 years, hazardous materials have been placed into landfills at Site 300. Two of these are active landfills and seven of them are inactive. Eight of these landfills have ground water monitoring wells which have been sampled over the past three years. These wells were installed to meet Federal Resource Conservation and Recovery Act (RCRA) ground water monitoring requirements. This has helped the Laboratory identify potential ground water contamination problems and provided the basis for defining the tasks to be done in FY 1987 and beyond. Laboratory records show that at least some of these landfills contain hazardous materials which must be cleaned up. The monitoring wells have already detected traces of contaminants such as tritium, TCE, organic solvents, and heavy metals. The records for one of the landfills show that over 2,000 capacitors containing polychlorinated biphenols (PCB) are buried there.

(4) Liquid Waste Discharges

The objective of this work is to prevent the potential accidental or uncontrolled release of toxic and radioactive pollutants to the local ground water and to the City of Livermore sewage treatment plant.

(5) Underground Tanks

The principal objective is to remedy any leaks of toxic fluids in underground tanks, sumps, and related underground piping systems and to remove any soil where prior leaks have caused unacceptable contamination. There are about 110 known underground tanks or sumps at the Livermore Site and about 25 underground tanks at Site 300. There are an unknown, but probably small, additional number of such tanks that have been filled up, removed or abandoned that could have leaked. Only a portion of these tanks contain or previously contained "regulated" fluids; for example, gasoline, plating shop wastes, diesel oil, or contamined rinse water. During FY 1985, a program was initiated to leak test all tanks with potentially hazardous liquid contents (current and past) using a certified test technique. If it is determined that a substantial toxic liquid leak had occurred, then an assessment will be made to determine the levels and extent of the contamination in the adjacent soil regions or underground waters. If this assessment shows unacceptable contamination, then the soil and/or local ground water may need to be recovered, cleaned up, removed and/or reconditioned. The amount of effort needed for the cleanup will depend upon an assessment of the local situation for each tank.

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(6) PCB in Electrical Equipment

The objective of this activity is to reassess and remedy known and potential contamination of PCB in specific LLNL electrical equipment and to prevent and avoid the potential consequences of a fire of PCB containing equipment. A survey was performed by LLNL of PCB containing electrical equipment (transformers, capacitors, inductors, etc.) in 1980 and 1981. Over 8,000 equipment items were evaluated. Many had samples taken and analyzed to determine the PCB content in the dielectric fluid and those found to contain PCB were labelled with a warning sign if above 500 ppm. The small capacitors (less than 3.0 pounds of dielectric fluid) are specifically exempted and need not be controlled and were not sampled or analyzed. A number of larger transformers with PCB content in excess of 500 ppm were identified in the Laboratory's power distribution system, and they should be replaced. A reassessment will be made and the 1980/1981 PCB survey will be updated; certain equipment used in experimental programs will be included. Additional laboratory analysis of dielectric fluids will be made. The result will be a list of equipment that requires remedial actions (such as spill containment, remove equipment, displace PCB, replace equipment, add fire protection, etc.).

(7) Reactor Decommissioning

A Decommissioning Plan for the pool reactor was required by Department of Energy prior to the reactor shutdown. A plan was prepared and submitted in September 1979. That plan stated the decommissioning would be concluded after a five year cool-down period. There is no investigation required to define what remedial action must be accomplished.

b. Facilities Design and Construction

As the investigation and assessment effort begins to identify the extent and parameters of specific sites of contamination, remedial actions must begin to correct the problems. This effort must start at the first sites investigated even as new, additional sites are being looked at. In some instances, particularly the contaminants which have already been identified and analyzed, corrective actions can begin almost immediately. Some of these require the design, construction, and operation of structures to treat the contamination.

(1) Underground and Surface Waters

The treatment will require the sinking of recovery wells to pump water to a treatment plant. Depending on the type of contaminant, the treatment will include air stripping, activated carbon absorption, clarification, oxidation/reduction or possibly other processes. Treatment plants will be designed and constructed at the Livermore Site and at Site 300. The environmental assessment work planned for FY 1985 and FY 1986 should permit an early 1987 start on the first

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treatment system, a low-flow pilot treatment system. Thereafter, two or more treatment plants will have to be designed and built before full-scale underground water cleaning treatments can commence. Based on water data available to date, one treatment plant is required for Site 300 and three plants for the Livermore Site.

The design of the treatment plant must provide for the adequate removal of the contaminants and the recovery of hazardous products where these are significant. The extent, complexity, and therefore the cost of treatment depends critically on the type and concentration of the contaminated species. For highly volatile organic toxic materials in small concentrations, a simple air stripping system should be adequate. For other organic compounds and higher percentages, additional removal processes such as absorption by highly activated carbon columns is needed. For dissolved metallic species (e.g., chromium, copper, nickel, etc.) an ion exchange process is needed and some other impurities will require a reverse osmosis process.

(2) Soil Contamination

There are currently no structures identified which must be designed and built to remedy soil contamination. Corrective action to be taken is described in paragraph 8.c(2) below.

(3) Landfills

To reduce the waste volume placed in the landfill and to decontaminate actively some of the wastes requires the designing, constructing, activating, obtaining a permit, and demonstrating a hazardous waste incinerator system to be located at Site 300. The system will thermally decompose hazardous wastes, such as PCB contaminated capacitors, organically contaminated soils, hazardous organic solvents, and reduce the volume of firing table debris. The incinerator will have a size reduction capability (for cutting up metal scrap, barrels, transformers, etc.) an afterburner, a scrubber, a dewatering system for concentrating the solids in the scrubber liquid, and other auxiliaries. It will be necessary to demonstrate the capability to destroy and/or remove 99.999 percent of typical difficult wastes (such as PCB) before an operating permit can be obtained.

For materials containing highly toxic organic compounds (e.g., Phenols, PCB, etc.), it has been shown that it is cost effective to use thermal destruction (at furnace temperatures of 2100 to 2200 degrees F) rather than the alternative of hauling to an approved hazardous waste landsite when large quantities of soil or materials are involved.

The incinerator will continue to operate as part of the Laboratory waste management effort after FY 1991 when work under this project will have been completed.

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(4) Liquid Waste Discharge

There are currently no structures identified which must be designed and built to treat liquid waste discharge contamination. The remedial action to be taken is described in paragraph 8.c(4) below.

(5) Underground Tanks

Remedial action of either removal, replacement, or upgrade will be required for those tanks that were identified to have leaked or are leaking. Depending on local conditions, the upgrading will be either a second shell (tank within a sump), a replacement with an above ground tank or pipes, or a new underground tank that conforms to newly enacted state legislation.

(6) PCB in Electrical Equipment

There are currently no structures identified to be designed and built soley to address this problem. The incinerator described in paragraph 8.b(3) above, however, will provide an appropriate level of treatment to remedy the situation.

(7) Reactor Decommissioning

There are currently no structures identified that must be designed and built to assist in the decommissioning of the reactor.

c. Environmental Corrections, Cleanup, and Abatement

At the same time that design and construction of facilities begins to address some of the cleanup requirements, extensive, non-facility activity must commence to address other problem areas. As with the structures, work of this type must also commence as the extent and parameters of the contamination at a particular site becomes known. Here again, corrective actions at some sites will begin while investigation and assessment continues at others.

(1) Underground and Surface Waters

With existing assessment techniques, it is difficult to estimate accurately the cleanup effort required because the exact configuration of the contaminated plume is not usually accurately predicted and actual contamination levels of pumped ground water may differ from those that were initially sampled. It may require tens of years of pumping and treatment to remedy properly the contamination in any of the several underground waters. Therefore, many of these

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pumps and treatment plants will continue to operate after FY 1991, when work under this project will have been completed. The operating costs (number of personnel, electric power, chemical additives, maintenance, etc.) can vary significantly depending on the complexity and size of the treatment system.

To eliminate contamination of surface waters will require containment of the surface water runoff over a major portion of the Livermore Site. Containment of the runoff will be achieved through lining existing drainage channels and the lining of a water impoundment basin where surface water can be monitored and, if necessary, treated before discharge.

(2) Soil Contamination

If, as expected, the assessment of soil contamination shows excessive levels, then it will be followed by a cleanup operation. It could be the hauling of the soil to approved hazardous waste sites or possibly the destruction of toxic organic species in the soil by heat through the hazardous waste incinerator described in paragraph 8.b(3) above. The exact method of treatment will depend on the contamination parameters found in the assessment. There is a large uncertainty in these costs depending on the nature of the soil and the local geology. Often the full cost is not known until the contaminated soil has been largely removed and no further contaminated pockets have been identified. Best estimates based on initial assessments and experience were used.

Soil pollution is often accompanied by ground water pollution. Although all these locations are likely to encounter primarily soil pollution, they may have pollutants that seeped into the ground water, also requiring some ground water withdrawal and treatment.

(3) Landfills

When possible and prudent, some of the existing landfills, both active and closed, will require final impervious covers and barrier protection against lateral movement of contaminants. A new landfill needs to be designed and permits obtained to accommodate materials removed from old sites, contaminated soils, and future generated wastes.

(4) Liquid Discharges

To prevent toxic or radioactive discharges to the City of Livermore sewage treatment plant will require remedial efforts in four areas:

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(a) Spill Containment for Above Ground Liquid Waste or Products

Positive secondary containment will be provided for a series of above ground tanks and parked tank trucks containing toxic chemicals, road oils, or fuels. In most cases, positive secondary containment will be provided by bermed concrete pads lined with an inert epoxy coating.

(b) Correction of Noncompliant Industrial Wastewater Discharges

Several storm drain connections will be disconnected and reconnected directly to the sanitary sewer system. There are currently four known locations where backwash fluids are discharged into the storm sewers; they are the backwashing systems for the LLNL swimming pool, the Low Conductivity Water (LCW) system, and the upgrading of two washdown systems for cooling towers. Due to operating constraints, the four backwash systems must be discharged during peak sewer use periods, when sewage flows are too high for the already over-extended sanitary sewer system. Therefore, onsite containment of backwash effluent is to be provided with controlled extended-time discharge to the sewer.

(c) Sewer Diversion/Retention System

An emergency diversion system will be provided for potential uncontrolled, unscheduled, or accidental releases of toxic and radioactive materials entering the sanitary sewer system. The system will consist of a basin and limited pretreatment equipment to retain and treat accidental or unauthorized spills prior to discharging into the City of Livermore's sewage treatment system. If the contamination is within permissible limits, the diverted sewage would be released slowly into the city sewer without treatment. Diversion of sewage would be initiated by a series of monitoring instruments. The diversion basin will be sized to contain an eight-hour spill occurrence period as well as one feet of precipitation in the basin. Based on past monitoring records, this should provide sufficient detention time to contain all potential process spills and would at the same time allow for some possible chemical treatment and aeration for cases where the contamination is above allowable limits.

(d) Rehabilitation of Existing Sewer System

The existing sanitary sewer system will be rehabilitated. The work is aimed at reducing the infiltration of rainwater into the sanitary sewers during the wet period and the infiltration of sewage into the soil and ground water during the dry season. The initial effort will be an infiltration and inflow study to understand the flow distribution and likely major leak locations. The rehabilitation of the sewer will include pressure grouting of open joints, slip lining of cracked or damaged sewer pipe, and replacement of some segments.

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(5) Underground Tanks

To correct the problems identified during the assessment will require the removal and replacement or upgrade of those tanks or pipes that were identified to have leaked or are leaking and that were not previously remedied. Depending on local conditions, the upgrading will be either a second shell (tank within a sump), a replacement with an above ground tank or pipes, or a new underground tank that conforms to the new regulations.

For tanks or sumps with hazardous contents, means are to be provided for detecting leaks. This could be a simple procedure for periodic monitoring or alternately some diagnostic instruments (with or without automatic alarms) for indicating a leak.

(6) PCB in Electrical Equipment

Any electrical equipment identified in the reassessment (paragraph 8.a(6) above) as containing PCB will be removed, disposed of, and replaced by new equipment. This will include both transformers and capacitors.

(7) Reactor Decommissioning

The work to be accomplished is divided into five tasks. During task 1, preparations will be made for the removal and demolition operations. This will include placing containment building support and safety facilities in operation, installing temporary facilities (change room, decontamination area, etc.), and removing unneeded equipment. Task 2 will cover removal of radioactive material from the thermal columns and reactor pool tank. The demolition of the reinforced concrete reactor shield structure, task 3, will be done by an experienced subcontractor. Task 4 concerns the removal and disposal of ancillary facilities. Task 5 will recondition the building for reuse by replacing the floor area.

d. Monitoring

Before, during, and after all work to be accomplished in this project, efforts will be made to monitor existing conditions. These monitoring efforts are essential for the understanding of initial conditions, warning or impending contamination during work, and followup assessment of the work that will be accomplished.

The FY 1987 funding is currently planned to initiate investigation/assessment activities for items (1) through (5), and to initiate design and remedial activities for items (1), (3), and (5). However, pressures from regulatory authorities could result in a reprioritization of emphasis of assessment and remediation efforts.

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9. Purpose, justification of need for, scope of project

The principal justification for the ECC project is to upgrade or correct a series of environmental local contaminated areas/equipment/liquids and to comply with Executive Order 12088 (which causes Federal facilities to comply with all applicable Federal, state and local pollution control requirements). In the past, LLNL operated a number of facilities in manners that are no longer considered environmentally acceptable. As is the case with most old facilities, they were built and operated to environmental standards that no longer conform to the new laws. As already mentioned in the prior section (Description of Project), chlorocarbon contamination of unknown origin in ground waters beneath the Laboratory and areas adjacent to the Laboratory have lead to being nominated by the EPA for the National Priority List for contaminated sites. Past operations on the laboratory property, including surface discharges, and burial of toxic materials at Site 300, including PCB containing electrical equipment in closed landfills, have also created conditions that are not now consistent with new laws. These and other problems must be corrected. Separate discussion of each of the contamination types is contained in paragraph 5a(1) through (7) below.

This ECC project is a multiyear line item for identifying, assessing, and remediating or cleaning up to correct Laboratory environmental contamination or threat of contamination. The project covers a group of one-time assessments and one-time corrections of unacceptable local environmental conditions. The goal of the project is to correct problems created by past operations or practices, bring the Laboratory into compliance with applicable laws and regulations, or, where prudent practice dictates, achieve a greater degree of correction. The long term goal is a Laboratory that is environmentally a safe place and that poses no harm to the local environment or community.

As a Federal facility, LLNL is required to comply with Federal laws, DOE Orders, and the increasingly stringent state and local equivalents of Federal laws and regulations which are being implemented and enforced by state, county and local regulatory agencies. Most of the interactions in this project will be with these local agencies: the Regional Water Equality Control Board, the California State Department of Health Services, the Bay Area Air Quality Management District, the San Joaquin County Air Pollution Control District, and the regional office of the EPA. New laws, new regulations, and permit requirements are being created at an ever-increasing rate. In 1984, for example, the State of California enacted 40 new bills concerned with environmental issues. The priorities and timing requests for funds are based on a best effort estimate of the hazard, expected regulatory agency actions, and total costs.

Pressures from regulatory agencies have been very high and major unplanned expenditures have already had to be made to satisfy their requirements. The potential consequences of not supporting this ECC project are as follows:

a. LLNL could be out of compliance with several regulations and thus not conform to Federal and/or state Laws.

b. Compliance orders can cause the shutdown of shop operations, major experiments, or laboratories where toxic materials are not adequately controlled and are released to the environment. This in turn can cause significant delays and extra costs

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to Laboratory programs. Recent interactions with the California Regional Water Quality Control Board have, for example, almost resulted in shutting down our high-explosive (HE) processing operation which would have caused a major disturbance and setback in weapons testing.

c. Additional unplanned mandated emergency cleanup operations will be required, and they will divert large amounts of program funds intended for other purposes.

d. Failure to correct will create unfavorable publicity (local and national) for the Laboratory, University, DOE, and the U.S. Government, and potential rallying causes for environmental and anti-nuclear activists.

e. Regulatory agencies can impose substantial fines, such as $25,000 per day, per violation and in some cases local agencies can imprison or hold personally liable managers and/or employees who knowingly allowed environmental contamination to continue.

f. A further delay can increase the potential for additional lawsuits by parties who believe that they were damaged. Several lawsuits are currently pending; those costs potential cannot be identified.

(1) Underground and Surface Water Assessment and Cleanup

This work will allow cleanup of contaminated ground water and control of sources which could potentially contaminate ground water. The protection of ground water resources is regulated by the California State Water Quality Resources Board and its Regional Water Quality Control Board. They have a non-degradation policy which prohibits activities which would impair beneficial uses of water which, in most cases, requires meeting drinking water standards, state action levels for drinking water, or in the absence of criteria and standards, relevant data on health effects and potable use. The Board requires ground water cleanup to a level that maintains beneficial uses plus soil cleanup to prevent contamination from entering uncontaminated ground water. Cleanup plans are to be adopted by way of an issuance of Waste Discharge Requirements, which is a State Regional Water Quality Control Board discharge permit.

The State Water Code provides for the assessment of civil monetary penalties for various circumstances of illegal discharge. The Board decides whether it wishes to pursue monetary penalties for each individual ground water contamination case. Historically, enforcement actions have not been taken if there has been a reasonable effort to prevent and/or detect the discharge of contaminants, cooperation in detection and reporting the contamination, prompt abatement of the discharge and pursual of a prompt and effective cleanup, and the discharge will not result in a long-term impairment of beneficial uses of waters. If enforcement actions are taken, the Water Code allows fines up

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to $5,000 per day for most illegal discharges and for hazardous wastes, penalties up to $25,000 per day may be applicable. Penalties are based on the number of days that the discharge occurred.

The Laboratory was recently nominated for the National Priorities List because of the ground water contamination in the area. The local communities surrounding the Laboratory draw a portion of their water from wells. There is concern and public pressure to remove the contamination from the underground water. Because large public water supplies and small private wells are located downgradient from the Livermore Site and because the public is demanding action on ground water contamination cases in the State, prompt action is being required of LLNL by State agencies.

The surface drainage system and the impoundment located at the center of the Livermore Site have been identified as likely pathways for ground water contamination if a hazardous substance is inadvertently released. Both of these need to be corrected.

(2) Soil Contamination Assessment and Cleanup

This work will allow assessment and cleanup of sites where soil contamination may have occurred as a result of practices that were acceptable in the past. The concern has been that the contaminants in the soil can spread into the ground water. Two areas, the photolab rinsewater discharges sites and HE lagoon sites, are being closed pursuant to State Water Code requirements.

The protection of ground water resources is regulated by the State's Regional Water Quality Control Board. They have a non-degradation policy which prohibits activities which would impair beneficial uses of water. The Board requires action to ensure that contamination will not enter uncontaminated ground water. This is regulated through issuance of Waste Discharge Requirements, which is a State Regional Water Control Board discharge permit.

The State Water Code provides for civil monetary penalties. Fines of up to $6,000 per day for unpermitted discharges and up to $25,000 per day for hazardous waste discharges can be applied.

(3) Landfills Assessment and Cleanup

This work will allow for management of buried hazardous wastes, prevention of environmental contamination associated with leaky landfills, and disposal of potential PCB landfill contamination. Currently, all of the landfills need to be upgraded to meet State of California Title 23 Subchapter 15 specifications for landfills, and, in the case of the landfill complex where traces of tritium and TCE are being detected, an upgraded monitoring program must be designed and implemented and remedies such as barriers installed to meet EPA Resource Conservation and Recovery Act

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requirements. The two active landfills need to be upgraded to meet State Department of Health Services Interim Status Permit requirements for landfill covers and all landfills need to be upgraded to meet State Regional Water Quality Control Board Waste Discharge Requirements for landfill covers.

Both State agencies have sent LLNL letters of deficiency citing the improper landfill covers. To achieve compliance with the agencies listed above and to improve environmental protection, landfill contents must be protected in a way to preclude migration of contaminants from the facility. To prevent future problems, PCB contaminated wastes should be removed and thermally destroyed or disposed of properly in a landfill that meets regulatory specifications.

Failure to understand and address contaminant movement could lead to a regulatory staff position that the Laboratory is ineffectively addressing actions to mitigate problems. The State Water Code, as administered by the Regional Water Quality Control Board, allows fines up to $6,000 per day for illegal discharges and, for hazardous wastes, penalties of up to $25,000 per day can be applied. If an active landfill does not meet hazardous waste requirements, LLNL's hazardous waste operating permit can be suspended, with possible penalties of up to $25,000 per day imposed for noncompliance and major delays and extra cost to program operations.

Because there is a potential for ground water contamination from leaching of hazardous wastes from the landfills by rain water, it is important to upgrade the containment structure of the landfills. Since contamination has started to appear in ground waters downgradient of several landfills and because the Laboratory has been in noncompliance with cover requirements for over five years, this effort should be started in FY 1987. It is unlikely that an extended schedule would be allowed by the regulatory agencies beyond this time.

(4) Liquid Waste Discharge and Compliance

In the current regulatory climate, it is prudent practice to place berms and other methods of spill containment around many aboveground tanks and parking areas for tanker trailers/trucks that store toxic liquids, chemicals, and diesel fuels. A number of these areas need to have such containments designed and built. The LCW system, swimming pool, and cooling towers discharge industrial waste water indirectly to the ground water. Radioactivity, heavy metals, and low pH anomalies are monitored on occasion in the sanitary sewage, but no means of containing detected uncontrolled spills exists. The City of Livermore sewage treatment plant, which processes the LLNL effluent, is at risk from an accidental toxic, organic, or radioactive spill into the sewer system. Such a major spill can cause the City plant to become inoperative and unable to treat sewage. A non-complying unlined earthen pond now exists for by-pass emergency storage when repair work is required to be done on the monitoring station.

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The Federal Clean Water Act (CWA) and the State of California Porter-Cologne Act, administered by the California State and its Regional Water Quality Control Boards, prohibits discharge of hazardous waste and most industrial waste waters to the ground and, in effect, have established a non-degradation policy for ground water resources. Failure to comply with the discharge requirements could result in fines of up to $6,000 per day for waste water discharges and up to $25,000 per day for hazardous waste discharges.

The City of Livermore sewer ordinance contains provisions for the protection of their sewage treatment plant and for the sewage plant's ability to meet state discharge requirements. The ordinance describes the nature and type of pollutants and waste water generally prohibited from direct treatment and that require pre-treatment by users prior to disposal. The ordinance specifically lists the discharge limits for pollutants that are likely to appear in the LLNL sewage effluent if an accidental or unauthorized release occurs. The ordinance provides for the protection of the treatment plant from accidental discharge of prohibited materials and substances by requiring the user to construct, operate, and maintain detection, retention, and pre-treatment facilities.

Any violation or nonconformance with the ordinance may invoke revocation of the LLNL permit to discharge. LLNL is also liable to the City for any expense, loss, or damage occasioned by the city by reason of violation; an incident that costs up to $2,000,000 per occurrence is possible.

The consequences of deferring this effort could be extremely costly emergency cleanups as well as fines in the event of an accidental spill and/or contamination. Such an accident could prompt a "shut down" of LLNL by local, state, or Federal authorities, and a requirement for the immediate construction of their imposed remedies which may include all or part of the described subproject tasks.

The existing sewer system is suspected to have leaks that contribute sewage to the underground water. A rework to seal the leaks is needed to minimize this potential contamination and to minimize fluctuations in sewer flow due to rainwater.

(5) Underground Tank and Pipes, Assessment Remedies and Cleanup

The control and upgrading of LLNL underground tanks and pipes is regulated by the State of California Water Resources Control Board and its Regional Water Quality Control Boards and local county ordinances. The agencies require submission of a tank inventory and testing of underground tanks for leaks according to a certified test procedure and monitoring for future leaks. If soil or ground water are found to be contaminated by leaks, then this falls under the regulation and penalties listed in items 9.(1) and 9.(2) above. There are provisions for reporting leaks to the

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9. Purpose, justification of need for, scope of project (contd.)

Department of Health Services and the Regional Water Quality Control Board. A new State law governs monitoring and compliance, and its regulation is allocated to the responsible local county or city.

Penalties for noncompliance with the tank inventory submittal requirements include fines of $500 to $5,000 per day for each day the submittal has not been received and $2,000 to $20,000 per day for each day false information submitted goes uncorrected. The penalties for failing to take actions concerning permitting, monitoring, maintaining records, compliance, and closure of an underground storage tank include fines of $500 to $5,000. If records are falsified or unauthorized releases are not reported, fines of from $5,000 to $10,000 or imprisonment in the county jail for up to one year, or both, can be imposed.

The mandated timing deadlines required for accomplishing the work are: (1) completion of testing by July 1, 1985; and (2) implementation of leak detection and subsurface monitoring systems by July 31, 1988. Schedules for action on leaking tanks are mandated on a case-by-case basis, as determined by State Water Quality Control Board and Department of Health Services policies described in 9.(1) and 9.(2) above. Additional regulations on underground tanks are currently being formulated by State agencies.

(6) PCB in Electrical Equipment, Reassessment, Disposal, and Displacement

The principal justification for performing this work is to avoid PCB contamination resulting from a fire and to minimize the consequences of a major leak into the ground because such events would require a very expensive cleanup operation. Such a clean-up effort has cost between $3 and $16 million per incident in actual occurrences in other establishments.

If PCB liquid is spilled onto the soil, then there are severe regulatory requirements (and penalties) in California for cleanup to less than five parts per million in the soil.

(7) Nuclear Reactor Decommissioning

A Decommissioning Plan for the pool reactor was required by DOE prior to the reactor shutdown. A plan was prepared and submitted in September 1979. That plan stated that the decommissioning would be concluded after a five year cool-down period. It is now proposed to complete this project in the FY 1989-1990 timeframe. Continued deferral will result in larger eventual costs and cause us to be out of compliance with the plan. Removal of the reactor, including the external structure, radioactive shielding, internal components, and equipment, will dispose of a substantial amount of radiation waste. In addition, it will permit unrestricted use of the 250,000 cubic feet building with excellent high-bay space. The cost of an equivalent new building would be higher than the cleanup costs.

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10. Details of cost estimate a/

	Item Cost	Total Cost
a. Engineering, Design, & Inspection		$ 24,000
(1) Related to Facilities	$ 8,620	
(2) Assessments, Investigations, & Monitoring	15,380	
b. Construction Costs		49,900
(1) Improvements to Land, including grading, paving, roads, parking, fences, and landscaping	7,000	
(2) Facility Construction		
(a) Large Treatment Plant(s)	16,750	
(b) Hazardous Waste Incinerator	6,850	
(c) Other Construction	9,400	
(3) Utilities, including electrical, sewers, and water supply	9,900	
c. Removal and disposal of contaminated materials, abatement and cleanup		29,000
Subtotal		$102,900
d. Contingency at approximately 30 percent of above costs		31,100
Total project cost		$134,000

Cost Uncertainty and Contingency

The scopes of many of the planned activities are not well defined because it is extremely difficult to anticipate fully the extent, type, concentration, or distribution of contaminants in soil, beneath underground tanks, or in the water table until the field assessments have been completed, remediation efforts are well underway, or cleanup operations are well underway. The assessment of many of the suspected polluted areas has not been completed and in several cases not even initiated. Costs are, therefore, based, in part, on assumed values of pollution species, concentration and stratigraphic geological dispersion. The costs are based on existing technology. The progress in the state-of-the-art of environmental assessments and pollution

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a/ The costs are contained in a completed, detailed Conceptual Design Report. They are based upon detailed, unit cost data applied to the current, best estimate of the quantities to be treated.

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10. Details of cost estimate (contd.)

treatment is changing very rapidly and this will affect the costs. Also, the state-of-the-art of health science is changing. This will affect the understanding of health effects and, in turn, the permissible levels of toxic materials in water, air, or soil.

In addition, there are uncertainties in how quickly and how effectively local regulatory authorities will enforce the existing environmental laws and regulations. It is also essentially impossible to anticipate how many new laws, rules, and regulations will become requirements for the Laboratory in the years before this project is completed (FY 1991). The public pressure for cleaning up the environment has caused a flurry of new laws and requirements that are being created (or will be created) by the legislatures and local regulatory bodies.

Some of the estimated cost items (such as certain facility/construction items) have relatively small contingencies and should be close to their actual costs. However, environmental assessments and cleanup operations cannot be accurately estimated and even a large contingency may turn out to be inadequate. The first year FY 1987 has a firm budget of $7,000,000, but the cost uncertainty for the remaining 4 years increases each year. This first year will permit completion of the highest priority assessments and begin remedial actions. At the end of this period, a better estimate of the remaining effort and cost can be made.

11. Method of performance

(a) Assessments will be largely performed by LLNL personnel and include sample collection, analysis, and evaluation. Several portions will be subcontracted to Environmental Engineering or Professional Consulting firms on a negotiated basis. Well drillings will be accomplished, where feasible, on a negotiated fixed price basis after competitive bidding.

(b) Equipment Procurement will be on a fixed price basis after competitive bids, whenever possible. Installation will be by equipment vendor or facility construction contractor, where feasible, otherwise by in-house personnel.

(c) Design of major facilities (e.g., the retention/diversion system) will be on a negotiated architect engineer contract. Minor items will be designed in-house.

(d) Construction of a major facility will be on a fixed price basis after competitive bidding. Minor facility construction can be by in-house captive contractor or in-house craft personnel.

(e) Cleanup and Contamination Abatement Operations will be, where possible, on a negotiated basis after competitive bidding, with provision for add-on work.

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12. Funding schedule of project funding and related items

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	Total
a. Total Project Funding							
(1) Total Facility Cost							
(a) Construction line item	$ 0	$ 7,000	$ 20,000	$ 40,000	$ 44,000	$ 23,000	$134,000
Total Facility Costs	$ 0	$ 7,000	$ 20,000	$ 40,000	$ 44,000	$ 23,000	$134,000
(2) Other Project Funding							
(a) Conceputal design costs	130	0	0	0	0	0	130
(b) Other Project Related Costs	8,190	0	0	0	0	0	8,190
Total Other Project Funding	8,320	0	0	0	0	0	8,320
Total project funding (items 1 and 2)	$ 8,320	$ 7,000	$ 20,000	$ 40,000	$ 44,000	$ 23,000	$142,320

b. Total Related Funding Requirements	
(1) Facility operating costs per year beginning FY 1992	$ 5,000
Total Other Related Funding Requirements	$ 5,000

13. Narrative explanation of total project funding and other related funding requirements

a. Total Project Funding
   (1) Other Project Funding

(a) Total funding in this classification represents the conceptual design cost. Changing technologies may require additional effort not currently foreseen.

(b) Other Project Related Cost - Prior environmental assessments directly related to the project ($3,230,000), GPP construction and other similar construction ($1,770,000), and landfill cleanup operations ($3,190,000), all between FY 1984 and FY 1986; total is $8,190,000.

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13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other Related Funding Requirements
(1) Facility Operating Costs

Operating costs of the new facilities for utilities, supplies and personnel are estimated to be about $5,000,000 per year beginning in FY 1992. They are based on consultants' estimates, but will depend on the facility designs. Additional support personnel will be needed.

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Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

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3. Date A-E initiated: 1st Qtr. FY 1987

3a. Date physical construction starts: 1st Qtr. FY 1988

4. Date construction ends: 4th Qtr. FY 1990

5. Previous cost estimate: None
Date:

6. Current cost estimate: $67,400
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 4,300	$ 4,300	$ 4,300	$ 2,900
1988	26,200	26,200	26,200	15,500
1989	33,200	33,200	33,200	29,500
1990	3,700	3,700	3,700	19,500

8. Brief physical description of project

This project at the Lawrence Livermore National Laboratory (LLNL) will provide two physical protection systems: (a) "Super Block," and (b) "Buffer Security System."

a. Super Block

The physical protection system for the Super Block is designed to conform to protection requirements for Categories I and II quantities of special nuclear materials (SNM) and associated vital equipment. Within the Super Block will be sited the Tritium Facility, the Plutonium Facility, a Laser Isotope Separation Facility, and the Engineering Test Building.

(1) Protected Area

The Super Block is surrounded by a vehicle barrier and a pedestrian delay fence, delineating an isolation zone containing an intrusion detection system. Intrusion detection includes redundant and diverse alarms and assessment. Separate portals provide vehicle/pedestrian access allowing control and searches into and out of the protected area.

8. Brief physical description of project (contd)

(a) The intrusion detection system for the isolation zone consists of alarm sensors, closed-circuit television (CCTV), and protective lighting. The alarm sensors will be triple redundant and diverse. The alarms are located in discrete detection areas, and each area will be assessed by a fixed CCTV camera. Each alarmed area will have sufficient lighting to aid in CCTV or protective service officer assessment.

(b) Four hardened and elevated guard positions are provided to allow clear lines of sight along all four sides of the isolation zone, building rooftops, and spaces between the buildings. Two of these positions are integrated with rooftops of existing buildings, one will be integrated into the Office Building (trailer replacement) (item a(4)) in this proposal, and the fourth will be integrated with the northeast vehicle portal.

(c) The Protected Area will have three portals for access control of personnel and vehicles. The portals will be equipped with contraband sensors for detection of SNM and metallic objects. The portals will be hardened.

(2) Modifications to Material Access Area/Vital Area

Modifications will be made to existing buildings within the Protected Area. These modifications provide uniform detection and delay for the physical protection of the facilities within the buildings. Intrusion detection systems will be installed, including alarms and assessment. Portals for pedestrian access control and exit searches are provided. Fixed barriers will be used to provide uniform perimeter delay. Access denial systems will be installed in selected locations.

(a) Each facility in the Super Block requiring a Material Access Area or Vital Area will be equipped with redundant and diverse alarms and CCTV for assessment. The alarms will sense penetration of perimeters and selected rooms. Currently deployed alarm systems will be upgraded to conform with present security guidelines. The perimeters will be uniformly hardened by the use of fixed barriers consisting of walls or doors.

(b) New portals will be installed in those facilities having SNM or vital equipment. The portals will be controlled to limit entry to appropriately cleared individuals. At Material Access Areas, SNM detectors will be used in conjunction with exit searches. The portals will be hardened for protection of security personnel.

(3) Additions to Consolidate SNM Vaults, Radiographic Facilities, and Provide Secondary Alarm Station

Categories I and II quantities of SNM are presently stored and radiographed in facilities both inside and outside the Super Block. New facilities will be constructed as an addition to the Plutonium Facility to consolidate these functions inside the Super Block.

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8. Brief physical description of project (contd)

(a) Vault

As a major component of the Laboratory's plan to improve its safeguards and security posture, the addition includes a vault designed to accommodate all of the Laboratory's Categories I and II SNM inventory. This vault will serve as the central point for receiving, shipping, storage, and distribution for all SNM at LLNL.

(b) High Resolution Radiography Laboratory

A high resolution radiography capability is required to image assemblies containing plutonium parts. Application areas include observing gaps and joints in the course of device component assembly and making more accurate measurements in critical assemblies. Radiography will be conducted with a linear accelerator in a shielded area. This activity is presently conducted at various locations around LLNL making security costly and difficult; location within the Super Block will solve this problem. Some existing equipment will be relocated from other locations for use in this laboratory.

(c) Secondary Alarm Station

A secondary alarm station will be located in the Super Block. It will provide alarm and video monitoring for protective service officers, as well as communications to facilities and personnel supporting the protection of the Super Block. The Secondary Alarm Station will be capable of processing all alarm and video signals from the Protected Area and the Material Access or Vital Areas. The station will be hardened. The Central Alarm Station is part of the ongoing line item project 85-D-103. Wiring and other features unique to and tying this project to the Central Alarm Station are part of this FY 1987 line item project.

(4) Office Building (Trailer Replacement)

Temporary modular facilities are presently used throughout the Super Block to house employees and computer systems. All the temporary facilities will be removed. New offices will be constructed to house only the people that will work in the Super Block. This facility, approximately 36,600 square feet, will be integrated with Protected Area features such as vehicle barriers, intrusion detection systems, and the vehicle/pedestrian portals. Provisions for classified matter storage and use will be included. These facilities will be equipped with alarm rooms and secure containers for storage of classified matter.

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8. Brief physical description of project (contd)

b. Buffer Security System

This physical protection system is designed to conform to requirements to protect Government property from substantial loss and Laboratory personnel from injury. The Buffer Security System will be located at the LLNL site perimeter.

(1) Personnel Delay Fence/Vehicle Barriers

The personnel delay fence/vehicle barrier will mark the inner perimeter of the buffer. The personnel fence will be a chain link fence with outriggers. The vehicle barrier will be part of the delay fence.

(2) Perimeter Intrusion, Detection, and Assessment System

The area between a trespass fence at the outer perimeter of the buffer and the personnel delay fence and vehicle barrier will be used to deploy alarm sensors, assessment CCTV, and protective lighting. The alarms will be diverse and redundant, located in discrete zones around the entire perimeter. Each zone will be assessed with fixed CCTV cameras and protective lighting.

(3) Patrol Road

A patrol road will be constructed near the delay fence. The road will be used for protective service officers responding to an alarm anywhere on the site perimeter. The patrol road construction will permit high speed response.

(4) Vehicle/Pedestrian Portals and Badge Offices

Current plans for access of personnel and vehicles to the LLNL site will be controlled by six vehicle/pedestrian portals and three badging facilities. Two each of the portals will be located on the west and south boundaries. One each of the remaining two portals will be located on north and east boundaries. The three badging facilities will be part of three of the portals. Improvements will be made to an existing facility presently located along the west boundary to accommodate shipping and receiving functions, thereby minimizing onsite deliveries.

(a) The vehicle/pedestrian portals will permit authorization checks of all personnel and vehicles entering the site without backing up traffic onto public roads. Each portal will be equipped with a holding area for selective vehicle searches. The portals will be integrated with sensors and assessment equipment to compliment the Perimeters Intrusion, Detection, and Assessment System. Portal integration will also include personnel and quick acting vehicle barriers.

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8. Brief physical description of project (contdl)

(b) Three badge offices at approximately 3,700 square feet each will be added near three of the portals. One will be used for LLNL personnel and visitors, a second will be used for contractor personnel, and the third for vendors.

c. Site Utilities

The utility extensions required to serve the facilities include city water, demineralized water, natural gas, compressed air, power, communications, sanitary sewer, and storm sewer. These major utilities will be extended from mains located in the immediate vicinity of the proposed facilities. Some existing utility lines will have to be relocated. Additional emergency power will be required.

d. Interfaces

The components and systems used in the physical protection system for the Super Block and the Buffer Security System must interface with existing line item construction projects. The interfaces consist of electronics for alarm and assessment components as well as architectural modification for portals and hardened response/surveillance positions. Additional interfaces are required with existing electrical and mechanical equipment.

The requested FY 1987 funding will be used to initiate engineering and design Titles I and II for the Super Block, approximately $3,300,000, and Title I for the Buffer Security System, approximately $1,000,000.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide for upgrading/enhancement of physical protection at LLNL as required to meet current U.S. Department of Energy (DOE) threat guidance. Detailed evaluations of the safeguards posture of LLNL resulted in the identification of various areas of security interests and/or existing systems which require upgrading/enhancement. Justification for each item included in this project is as follows.

a. Super Block

The LLNL identified areas of security interests include special nuclear materials, vital equipment, and weapon devices. Protection of these security interests require Protected Areas around Material Access Areas and Vital Areas. The Laboratory determined that a cost-effective solution could be implemented by consolidating SNM security interests into one physical area to be called a "Super Block."

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9. Purpose, justification of need for, and scope of project (contd.)

The design for the protection of the high security interests in a unified Super Block is a balanced solution that considered the threat and both one-time and operational costs. The Super Block permits the concentration of detection and response resources while minimizing the deployment of expensive delay components.

The overall advantages for the Super Block concept are:

- The detection components and response force can be concentrated.
- The delay components can be concentrated.
- Uniform protection can be provided for all radiological sabotage targets.
- The Protected Area components for the isolation zone and the entry control points can be uniformly hardened.
- Forced penetration by mechanized transportation can be denied.
- Interior hardening can use fixed and activated barriers.
- Dual interior detection and delay zones for SNM in use can be provided.
- Security inspector(s) can be in hardened position(s) protecting SNM in storage.
- Single Protected Area and Material Access Area/Vital Area entry control points can be used for normal traffic.
- Roving security inspectors can be deployed to interdict adversary(s) before they gain their objectives.
- Adversary penetration time would exceed response force interdiction time and the probability of neutralization would be very high.

(1) Protected Area

Proposed initial detection and delay components, located on the perimeter of the Protected Area, satisfy DOE guidance. System design includes an isolation zone between inner and outer barriers which has detection through diverse alarm sensors and redundant assessment capabilities including a CCTV system. The isolation zone and the entry control points are uniformly hardened against penetration attempts. The outer barrier for the isolation zone will stop a forced action, as will the "pop-up" vehicle barriers at the portals. Aircraft obstacles within the Protected Area will preclude airborne assault. These fixed barriers require either an escalation of the initial penetration attempt or an increase in the size of the adversary team to support the escape transportation. In either case, the Protected Area components dilute the resources of a potential adversary.

The combination of detection and delay at the Protected Area will alert security forces and positively identify an adversary action immediately when an assault begins.

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9. Purpose, justification of need for, and scope of project (contd.)

The portals for the Protected Area are required to establish authorization and verify all personnel during ingress and egress. Personnel are required to be searched for contraband when they enter or exit the Protected Area. The portals will be hardened so that they can be employed as part of the tactical response for action in the Super Block and in support of the hardened response positions.

(2) Material Access Area/Vital Area

The Material Access Area and the Vital Area will have detection and delay deployed in concentric zones beginning at the boundaries of buildings. The construction of these buildings limit penetration paths to doors and utility ports. The doors will be limited per building by architectural treatment of hallways. Only one or two doors in each building needs to be used as normal entry control points, the remainder will be used for emergency or special purposes.

The portals in the Material Access Area/Vital Area will be used to establish authorization and verify all personnel during ingress and egress. The ingress and egress transactions will be logged. Personnel will be checked for SNM on egress.

The Material Access Area/Vital Area intrusion detection system provides the protective service officers with timely and accurate alarm and assessment from discrete facility locations. The diversity and redundancy provide multiple layers of alarm to sense sophisticated adversaries.

The building perimeter for each facility will need to be hardened to provide uniform delay. Typically, industrial hardening of doors and walls adds minutes of delay per barrier. Thus, multiple levels of industrial hardening are required as a minimum to provide sufficient response time.

A new barrier will be installed that provides up to tens of minutes of delay. The barrier is an access denial system which is an activated barrier. The combined effect of fixed barriers and activated barriers will provide the delay necessary to deploy the response force.

(3) Consolidated Vault, Radiographic Facility, and Secondary Alarm Station

(a) The vault of the Super Block is necessary for the consolidation of SNM from other laboratory areas on the LLNL site. Existing facilities within the Super Block have insufficient capacity to accept new material. Additionally, those materials being brought together in the new vault have source terms precluding random storage and handling. The vault perimeter must be protected by a Material Access Area. Colocation will result in reducing onsite SNM traffic and a significant reduction in accounting.

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9. Purpose, justification of need for, and scope of project (contd.)

(b) The radiography facility is required to examine materials or items that are stored, used, or manufactured within the Super Block. The movement of these materials out of the Super Block to an existing radiography facility creates an unacceptable security risk and programmatic cost.

(c) The secondary alarm station is an alternative to the central alarm station for protection of a Protected Area, Materials Access Area, and Vital Area. The secondary alarm station is located in the Super Block because of the inherent self-protection afforded by the Protected Area and because of the minimization of alarm and assessment cabling costs.

(4) Trailer Replacement

Protection of classified matter in the office building is required by DOE guidance. Those offices and areas using or storing matter will be equipped with the alarms and physical doors/locks.

The new offices are required to house personnel existing in temporary facilities in the Super Block. Temporary facilities, scattered throughout the Super Block, could provide concealment and protection of adversaries maneuvering to targeted facilities. Both exclusion tactics and containment tactics are rendered more difficult by these structures. The structures diminish the efficiency of the protective lighting and the effectiveness of surveillance cameras.

Also, the offices are necessary for the staff working in the Super Block so that they will transverse the Protected Area as infrequently as possible.

(5) Hardened Security Positions

Elevated, hardened response positions with clear lines of sight and fire will be used in the Super Block to support exclusion and containment tactics. The exclusion tactics require fewer personnel in defensive position to thwart an adversary attempt to reach an objective. The advantage of exclusion is that an adversary tactical action must begin immediately upon penetrating the Protected Area. These tactics deplete the adversary's available resources.

b. Buffer Security System

The Buffer Security System is being implemented to protect personnel and property in accordance with DOE guidance. Timely detection will permit effective response by protective forces and allow early warning for the Super Block. The accurate location and identification of an adversary permit the response forces to utilize tactics ranging from exclusion, for some key facilities, to containment for the site in general.

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9. Purpose, justification of need for, and scope of project (contd.)

(1) Personnel Delay Fence/Vehicle Barriers

Two delay services will be used to control ground penetration. The personnel fence will delay the adversary for accurate assessment and time for response. The fence further acts as a deterrent for a less dedicated adversary. The vehicle barrier is used to disable vehicles from being used to transport quickly an adversary or quantities of contraband material.

(2) Perimeter Intrusion Detection and Assessment System

The Perimeter Intrusion Detection and Assessment System is used to provide assurance of adversary detection along the site perimeter. The site being somewhat longer than one mile on a side and containing a significant capital investment must be protected against known activities of unsophisticated groups which are opposed to the Laboratory's mission. The use of redundant alarms and assessment will assure timely detection against this level of adversary. Detection at the Perimeter Intrusion Detection and Assessment System will also activate a "heads-up" alert status at the Super Block.

(3) Patrol Road

The over four mile perimeter will require a patrol road to support personnel movement. The patrol road will provide high speed movement of protective vehicles for use by protective service officers in responding to positive detection of an adversary.

(4) Pedestrian/Vehicle Portals and Badge Offices

Laboratory programs and facilities are currently utilizing approximately 9,100 permanent and temporary personnel with many of the personnel working in areas requiring special authorization. To aid in the authorization process, only personnel who have gained prior approvals will be admitted to the general site. Portals are located on the four perimeter faces of the Laboratory to provide relatively uncongested ingress and egress. Badge offices are needed at key portals to support the general authorization process. Badging will be used to identify approved personnel. At selected times, thorough searches of vehicles for contraband is necessary. In these instances, vehicle holding areas permit this procedure with the remaining vehicle flow proceeding unhampered.

Locating shipping and receiving functions exterior to the buffer/isolation zone eliminates the need for a great number of uncleared people driving freight transportation vehicles to enter secured area.

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9. Purpose, justification of need for, and scope of project (contd.)

c. Site Utilities

Utilities in the Super Block need to be enlarged in capacity and relocated to accommodate architectural changes caused by the establishment of the Protected Area boundary, removal of the temporary facilities, the new office building, and the addition to the Plutonium Facility. The existing electrical service will be relocated and increased in size and reliability to support the security upgrades.

The Buffer Security System will require new utilities to support the Perimeter Intrusion Detection and Assessment System and the new portals and badge offices. The Perimeter Intrusion Detection Assessment System will require civil and electrical upgrades. The portals and badge offices require electrical, water, and sewer to support personnel activities.

d. Interfaces

The Super Block provides a high degree of protection for high-value facilities and SNM. Some portion of the Buffer Protection System is required if the Laboratory is to utilize effectively the newly acquired and planned buffer lands to protect Government property. As a minimum, new fencing with vehicle barriers, patrol capabilities, portals, badge offices, and associated utilities are required. Also as a minimum, provisions should be made to incorporate a Perimeter Intrusion Detection Assessment System as proposed here. Both the Super Block and Buffer Protection System are integrated with ongoing project 85-D-103. Together, these projects will provide the levels of physical protection required.

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10. Details of cost estimates a/	Item Cost	Total Cost
a. Engineering, design, and inspection		$ 7,370
(1) Facility engineering at approximately 16 percent of construction costs, item b	$ 5,390	
(2) Equipment engineering at approximately 20 percent of special equipment costs, item c	1,980	
b. Construction costs		34,410
Super Block		
(1) Protected Area Work, including grading, paving, demolition, exterior security provisions, and landscaping	3,010	
(2) Modifications to Material Access Area/Vital Area - 8,070 square feet at about $278 per square foot	2,240	
(3) Addition to Material Access Area - 44,600 square feet at about $160 per square foot	7,120	
(4) Office Building (Trailer Replacement) - 36,600 square feet at about $148 per square foot	5,400	
(5) Utilities, including mechanical utilities, sanitary and storm sewers, electrical power, communications, and area lighting	2,460	
Buffer Security System		
(6) Assessment Zone, including grading, paving, security provisions, and landscaping	2,410	
(7) Badge Offices (3) - 11,100 square feet at about $116 square foot	1,400	
(8) Portals (6), including associated utilities and fencing	4,260	
(9) Modifications for Shipping/Receiving	1,010	
(10) Installation of Perimeter Intrusion Detection/Assessment System	5,100	
c. Special equipment, including intrusion detection systems assessment systems, and alarm station		9,820
d. Standard equipment		5,940
Subtotal		57,540
e. Contingency at approximately 17 percent of above costs		9,860
Total estimated cost		$67,400

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a/ Estimate based on completed conceptual design.

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11. Method of performance

Building design will be on the basis of a negotiated architect-engineer contract. Minor work and equipment procurement will be performed by LLNL forces. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total Project Funding						
(1) Total facility costs						
(a) Construction line item	$ 0	$ 2,900	$15,500	$29,500	$19,500	$67,400
Total facility costs	0	2,900	15,500	29,500	19,500	67,400
(2) Other project funding						
(a) Conceptual design costs	300	0	0	0	0	300
Total other project funding	300	0	0	0	0	300
Total project funding (items 1 and 2)	$ 300	$ 2,900	$15,500	$29,500	$19,500	$67,700

b. Other related funding requirements (estimated life of the project: 25 years)

(1) Facility operating costs	$ 183
(2) Programmatic operating expenses directly related to the facility	336
(3) GPP or other construction related to programmatic effort in the facility	100
Total other related funding requirements	$ 619

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
(1) Other project funding
(a) Total funding in this classification represents the conceptual design cost.

b. Total related funding requirements
(1) Facility operating costs

Operating costs of the new facilities are estimated to be $183,000 per year to include maintenance and utility cost.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements II, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 87-D-104

13. Narrative explanation of total project funding and other related funding requirements (contd.)

(2) Programmatic operating expenses directly related to the facility

These are the additional operation and maintenance staff for the new facilities and equipment.

(3) GPP or other construction related to programmatic effort in the facility

Initially no GPP costs are anticipated, but, to keep abreast of technology, presently undefined alterations will likely be required in the future.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

3. Date A-E work initiated: 1st Qtr. FY 1986

3a. Date physical construction starts: 2nd Qtr. FY 1987

4. Date construction ends: 1st Qtr. FY 1990

5. Previous cost estimate: $11,600
Date: 1/85

6. Current cost estimate: $36,400 a/
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 3,700	$ 3,700	$ 3,700	$ 3,500
1986 Sequestered	(0)	(100)	(100)	(0)
1987	5,400	5,400	5,400	3,800
1988	24,900	25,000	25,000	11,900
1989	2,400	2,400	2,400	15,300
1990	0	0	0	1,900

8. Brief physical description of project

This project will provide the Lawrence Livermore National Laboratory (LLNL) toxic waste control activities with new facilities for the decontamination and waste treatment functions. These facilities were initially proposed to be located adjacent to the existing solid waste disposal area in the southeast industrial sector of the LLNL site. However, because of the selected site's proximity to the Las Positas fault, the issuance of a "permit to construct" by the Department of Health Services (DOHS) and or Environmental Protection Agency (EPA) was dependent on the final results of a geologic investigation required by the DOHS and the Resource Conservation and Recovery Act when a new hazardous waste facility is located within 3,000 feet of an active fault. Results of the investigation indicated potential fault activity and DOHS would not approve the use of the site for a decontamination and waste treatment facility. Several alternative sites were investigated and an acceptable site has been selected in the northeast corner of the Livermore site. The total estimated cost of the project will increase to cover the extension of power, communications, and other utilities to the new site.

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a/ Recent earthquake faulting investigations require relocating the site for this facility and a consequent increase in the current cost estimate. Revision of the estimate is in progress.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

8. Brief physical description of project (contd.)

This project will enhance hazardous waste management at the Laboratory through the addition of approximately 86,700 square feet of new facilities for the decontamination and waste treatment functions. The Decontamination and Waste Treatment Facility will consist of new building facilities and equipment which include a liquid waste process building, decontamination and solid waste processing and packaging building, rotary kiln incinerator with enclosure, uranium burn pan with enclosure, solid waste receiving and classification building, operations support building, emergency generator, electric substation, boiler/chiller plant, and cooling tower. Land improvements will include paving approximately 1,340 feet of roads and parking areas for operational and employee vehicles, fencing, and a surface drainage control system.

All new buildings will have fire sprinkler systems. Hazardous and radioactive waste processing areas will have curbed concrete floors to contain spillage and water from the fire sprinkler system. Special coatings will seal the inside surfaces and provide easier decontamination. Various filters, a condenser, exhaust air scrubber, liquid retention, and pressure gradient systems will be incorporated together with alarms and monitors to ensure safe operations and environment protection.

Utilities will consist of water, compressed air, gas, steam, power, communications, storm sewer, and sanitary sewer. Existing mechanical and electrical utility lines and the 230/115-kV lines will be rerouted so they will not encumber the construction area and operational activities. This work includes a 1500-kVA substation, a 500-kW emergency generator, two 240-ton chillers, an 1100-gpm cooling tower, and a 100-hp boiler.

The decontamination and dry waste facility, approximately 13,800 square feet, is a one-story reinforced concrete frame structure. The building is divided into two main areas--the decontamination area and the solid waste processing/packaging area. Each area is provided with a 2-ton bridge crane, a truck air lock, and a 2-ton monorail hoist. Change rooms, toilets, and lockers are arranged to serve both areas. The floor slab will be cast-in-place concrete with a smooth finish over a vapor barrier. The mezzanine level will be a concrete slab and concrete framing, finish of interior walls, floor and all exposed surfaces will be smooth and coated with epoxy coating, all doors between contaminated areas and noncontaminated areas will be air sealed. The processes to be performed in this facility are chemical and steam cleaning, grit blasting, vapor decontamination, electro-polishing, ultrasonic cleaning, and mercury bakeout. Other functions to be performed are dry waste sorting, compacting, bailing, and packaging for shipment. The facility will also have a laundry and drum/tank cleaning capability.

The liquid waste processing facility, approximately 49,800 square feet, is a one-story steel frame structure with a clear height of 35 feet in liquid treatment areas and 50 feet clear height in the filtration and solidification areas. The building is divided into two main areas--radioactive liquid treatment and nonradioactive liquid treatment. Each area is provided with a 2-ton bridge crane. All interior walls, ceilings, and steel structure will be covered with epoxy coating, floors will be smooth surfaces with polyester epoxy coating. The process to be performed in this facility include radioactive and

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

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8. Brief physical description of project (contd.)

nonradioactive liquid waste and radioactive oily waste chemical treatment; filter press, ultrafiltration, and reverse osmosis filtration, evaporative concentration, and solidification. The facility will also include analytical laboratory.

The solid waste receiving and classification building, approximately 6,900 square feet, will be an insulated prefabricated metal building with a slab-on-grade foundation. It will provide the space necessary to receive, segregate, and store chemical and radioactive containers of all types and sizes until the proper analysis and classification are completed and a determination made on the treatment, packaging, and shipping methods required to prepare properly the wastes for safe ultimate disposal.

The burn pan enclosure, approximately 860 square feet, will be a prefabricated metal structure on a bermed concrete slab. The specific objective of the burn pan is to provide a safe and efficient means of oxidizing depleted uranium chips while meeting all safety and regulatory requirements.

The incinerator building, approximately 1,500 square feet, will enclose the rotary kiln incinerator, shredder, feed system, and ash removal system and will be similar to the construction of the decontamination/solid waste building. The building will be provided with a one-ton bridge crane.

The operational support building, approximately 12,700 square feet, is a two-story steel frame office structure. It will provide central support for the four operational functions--decontamination, liquid waste treatment, solid waste processing, and storage. It will bring together the supervisory, administrative, technical, and operational personnel currently housed in dispersed locations. It will also house the toxic waste control computer system for tracking hazardous waste and providing online information on waste materials during emergency conditions.

The boiler/chiller plant, approximately 1,200 square feet, is a prefabricated metal building which will house the central plant heating and refrigeration systems. The equipment for this plant will include, but is not limited to, centrifugal-type heat recovery chillers, steam boiler, and a cooling tower.

Special facilities in the project include the following process system components and their installation: Pumps and agitators, tanks and vessels, heat exchangers, blowers, reverse osmosis units, ultrafiltration unit, flocculator/clarifier, filter presses, solidification equipment, compactor, incinerator, evaporative concentrator, and a burn pan unit.

Standard equipment encompasses various decontamination equipment, monitors and counters, security alarms and detectors, chemistry laboratory and office furniture, and shelving.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

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8. Brief physical description of project (contd.)

Existing facilities handling the decontamination and liquid waste treatment work will be demolished or be decontaminated. Four modular buildings and a cylinder dock will be relocated and existing paved outdoor storage areas will be placed in other locations in order to clear the site for the new construction.

The total estimated cost (TEC) of this project has increased $24,800,000, from $11,600,000 to $36,400,000, as the result of a total rescoping of the project to bring the new design of the LLNL hazardous waste facilities into full compliance with the Resource Conservation and Recovery Act (RCRA) and its 1984 amendments. The original scope and TEC for this project was based on RCRA not applying to "activities subject to the Atomic Energy Act of 1954 except to the extent not inconsistent with the Atomic Energy Act." The Environmental Protection Agency had been informed of this position. Subsequently, based on a United States District Court decision to remove the Department of Energy (DOE) exemption to RCRA, the DOE and the EPA agreed in August 1984 that RCRA applies to facilities operated under the Atomic Energy Act which significantly changed the scope and TEC of this project. The deficiencies in the LLNL hazardous waste facilities have been substantiated by independent DOE/LLNL and regulatory agency inspections.

The FY 1987 funding will allow continuation of the design activities initiated with FY 1986 funding, perform environmental assessments and safety analyses and activities necessary to prepare required environmental permit.

9. Purpose, justification of need for, and scope of project

This project will replace the 40 year old, technically obsolete, structurally and environmentally submarginal decontamination facility and liquid waste treatment facility with new facilities. The existing facilities are located in a high-density area with insufficient surrounding space to allow the required expansion at their present sites.

Current facilities are in noncompliance with present day standards for environmental protection and seismic safety. Safe operation of these facilities (environmental and personnel) depends on administrative controls.

It is the intent of this project to provide a centralized Decontamination and Waste Treatment Facility which meets applicable Federal, state, and local environmental regulations and DOE Orders. If the existing facilities are not replaced, the state regulatory agencies will progressively impose tighter controls and restrictions such as prohibiting off-site hazardous waste shipments. This would force the Laboratory to stop operations when LLNL's waste storage capacity becomes unmanageable. The new design will bring the Laboratory's hazardous waste facilities into full compliance with the Resource Conservation and Recovery Act and its 1984 amendments. An environmental audit found the existing facilities deficient in the following areas:

- The present liquid waste treatment facilities cannot provide sufficient treatment to assure the effluent will meet the discharge limits established in the new City of Livermore sewer ordinance and the EPA electroplating and metal finishing standards of 40 CFR 413 and 433 as mandated in the Clean Water Act.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

9. Purpose, justification of need for, and scope of project (contd.)

- o Because some nonradioactive hazardous liquid wastes are currently treated in the same treatment units as radioactive wastes, the nonradioactive wastes become contaminated and therefore cannot be disposed of as is required for a Resource Conservation & Recovery Act waste.

- o The present facilities do not provide the necessary segregation, spill prevention, and containment to eliminate the potential for ground water contamination or assure compliance with Subpart I of 40 CFR 264 and California's Title 22, Chapter 30 minimum standards for hazardous and extremely hazardous waste management.

- o The existing radioactive and mixed wastes solidification and decontamination buildings do not meet DOE ventilation, contamination, confinements and physical safeguard requirements. Additionally, the radioactive waste storage area does not provide the proper segregation, weather protection, or spill prevention and containment measures.

- o There is presently no facility to react or neutralize exotic gases and chemicals which offsite commercial disposers will not accept. These chemicals therefore have to be stored indefinitely, creating a potentially dangerous condition.

Decontamination Facility

The existing decontamination facility is a structure built by the Navy in the early 1940's as a paint and dope shop. In the late 1950's, the structure was converted to a decontamination facility. Environmental and worker protection codes and practices have changed drastically since that time. Positive containment of radioactive substances is not always possible with the present building condition. A combination of a power failure (even though emergency power is available) and a breakdown of administrative controls, combined with a movement of material in or out of the outside door, could present a possibility of some contamination of the outside environment. Air locks for bringing in large equipment do not exist. The present electrical system is underpowered causing some operations to be delayed because all equipment cannot be operated at one time. As a result, the existing decontamination facility is wholly inadequate to meet the decontamination needs (volume and physical size), and the required containment of radio-toxic materials.

A facility designed to current standards and practices for radioactive materials processing is required. With improved ventilation and containment features and modern decontamination/cleaning equipment, the new facility will provide the weapons

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

9. Purpose, justification of need for, and scope of project (contd.)

programs with new capability and increase the recovery of equipment and precious metals. Other specific advantages of the new decontamination facility are:

a. Environmentally safer and better equipped laboratories which meet current seismic standards for "critical facilities." This will allow decontaminating and cleaning, for reuse by the programs, of equipment and materials contaminated with radioactive and toxic chemicals.

b. Improved facilities for transferring, shipping, receiving, and storage of material and equipment.

c. Consolidation of the decontamination operations into a centralized area to increase the efficient use of manpower, material handling equipment, and process stream flows.

d. The facility will meet all known or presently proposed Federal and state regulations concerning safety and the protection of the environment.

Liquid waste treatment facility

The existing liquid waste treatment facility is an old engine test building built in the 1940's for use by the U. S. Navy. The facility has been modified to process radioactive and hazardous liquid waste. Today, it does not have the capacity to meet the present and future processing demands nor does it conform to environmental regulations governing this type of operation. A barrel storage building was constructed in FY 1982 and equipment added to increase processing capacity this year, but there is insufficient space to allow additional expansion and needed environmental control modifications at the present site. Specific advantages of this replacement include:

a. The new facility will provide sufficient treatment to assure meeting the new restrictive discharge limits established by regulators.

b. Separate radioactive and nonradioactive liquid waste processing lines including a radioactive oily waste treatment system to comply with environmental regulations and DOE orders.

c. The increased nonradioactive processing capacity will greatly reduce the needs for offsite commerical treatment and disposal of hazardous liquid wastes, decreasing the environmental risks and future liability to LLNL for these offsite operations. Offsite treatment and disposal is becoming progressively more costly and future disposal operations are nebulous and continue to shrink.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

9. Purpose, justification of need for, and scope of project (contd.)

   d. Close capture ventilation and spill containment systems will provide the necessary environmental controls and personnel protection.

   e. Construction will be designed to meet current seismic standards.

   f. Consolidating the liquid waste operation into a centralized hazardous waste management facility will optimize manpower and facility utilization.

Solid Waste Receiving and Classification Facility

Receiving and classification is currently being performed in an open shed with limited space, resulting in many containers being stored outdoors. There are no facilities to segregate properly incompatible wastes and nothing to contain spills or container ruptures as required by the Resource Conservation and Recovery Act, California hazardous wastes regulations, and DOE orders. The new facility will provide the space necessary to receive, segregate, and store chemical and radioactive containers of all types and sizes until the proper analysis and classification is completed and a determination made on the treatment, packaging, and shipping methods required to prepare them properly for ultimate safe disposal. An office will be included in the facility for maintaining incoming and outgoing shipping documentation and inputting to the central computer through a terminal.

Burn Pan

Laboratory operations generate depleted uranium chips which must be oxidized and stabilized into a waste form which is safe for shipment and disposal. These chips will continue to be generated by the programs and must be processed.

Incinerator

The existing controlled air incinerator was orginally built in early 1978 and is currently in the process of being upgraded to meet Resource Conservation and Recovery Act requirements; however, by 1991, when the proposed facility is expected to be activated, the present incinerator will be near the end of its useful life and cannot be presumed to last much longer if used continually. Additionally, the old incinerator cannot handle the diverse mix of radioactive, mixed, and hazardous solid and liquid waste which require incineration in order to diminish their toxicity and volume. It is proposed to install a small rotary kiln incinerator, with a shredder at the input end and a complete scrubber and pollution abatement system on the discharge, to incinerate and destroy all types of both radioactive and nonradioactive organics, solvents, oils, miscellaneous chemicals, and solid wastes in an environmentally complying manner. The resultant waste residue would accordingly meet the intent of the 1984 Resource Conservation and Recovery Act amendments and consequently reduce LLNL's risk and liability for

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

9. Purpose, justification of need for, and scope of project (contd.)

offsite disposal. The permitting process for this unit is expected to be extensive; however, proposals to construct similar units in the Bay Area have been positively received by the regulatory agencies. Incineration is one of the preferred emerging technologies for hazardous waste treatment by both industry and the regulators. The old incinerator would remain for standby use and for the incineration of classified documents.

Operational support facility

This general purpose facility will be designed to support the four major operational functions: decontamination, liquid waste treatment, solid waste processing, and storage. The facility will bring together the technical and staff personnel currently fragmented in trailers and the existing dislocated facilities, plus new personnel. It will also house the toxic waste control computer system for tracking hazardous waste and will provide online information on waste material in an emergency.

The support facility will also provide a training room for personnel. The training of hazardous waste handling personnel is mandatory and required by law. Recertification of personnel is required every six months.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California	2. Project No.: 86-D-103

10. Details of cost estimates a/

	Item cost	Total cost
a. Engineering, design, and inspection		$ 4,580
(1) Construction at 17 percent of Contruction Costs, item b		
Title I & II	$ 2,060	
Title III	1,495	
(2) Environmental Assessments, Safety Analysis Reports, and Environmental Permits to Construct and Operate	1,025	
b. Construction costs		22,160
(1) Improvements to land, including grading, paving, parking, fencing, walks, and landscaping	$ 650	
(2) Buildings		
Decontamination and dry waste-13,755 square feet at approximately $168 per square foot	2,310	
Liquid waste (Process)-49,815 square feet at approximately $98 per square foot	4,890	
Solid Waste Receiving and Classification-6,900 square feet at approximately $57 per square foot	395	
Burn Pan & Boiler/Chiller Plant-2,010 sq feet at approximately $119 per square foot	240	
Incinerator-1,500 square feet at approximately $300 per square foot	450	
Operational support-12,682 square feet at approximately $109 per square foot	1,380	
(3) Special facilities including walk-in/decontamination hoods, treatment tanks, and equipment	10,010	
(4) Utilities, including mechanical utilities, sanitary and storm sewers, electrical power, communications, and area lighting	1,835	
c. Standard equipment		1,810
d. Removal, decontamination, and relocation costs		2,180
Subtotal		30,730
e. Contingency at approximately 18 percent of above costs		5,670
Total estimated cost		$36,400

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California	2. Project No.: 86-D-103

11. Method of performance

Design will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding. Minor work will be performed by LLNL employees.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	$ 3,500	$ 3,800	$11,900	$15,300	$ 1,900	$36,400
Total facility costs	3,500	3,800	11,900	15,300	1,900	36,400
2. Other project funding						
(a) Conceptual design costs	450	0	0	0	0	450
(b) Other project related costs	300	0	0	0	0	300
Total other project funding	750	0	0	0	0	750
Total project costs (items 1 and 2)	$ 4,250	$ 3,800	$11,900	$15,300	$ 1,900	$37,150

b. Other related funding requirements (estimated life of project: 25 years)	
1. Facility operating costs	$ 2,193
2. Programmatic operating expenses directly related to the facility	3,930
3. Capital equipment not related to construction but related to the programmatic effort in the facility	300
4. GPP or other construction related to programmatic effort in the facility	150
Total other related annual funding requirements	$ 6,573

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project costs

(a) Total funding in this classification represents the waste management study and the conceptual design cost.

(b) These costs were incurred in performing required site seismic investigations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Decontamination and waste treatment facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 86-D-103

13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

1. Facility operating costs

Facility operating costs include utilities and maintenance and offsite disposal costs.

2. Programmatic operating expenses directly related to the facility

Programmatic operating expenses represent an estimate for 47 toxic waste control and support personnel in FY 1991.

3. Capital equipment not related to construction but related to the programmatic effort in the facility

Capital equipment not related to construction but related to the programmatic effort in the facility is an average annual estimate which includes both the small items needed for continuous operation of the facility and the occasional large item (over $200,000) which cannot be described at this time but can be predicted as needed to maintain technical excellence in efforts conducted in the facility.

4. GPP or other construction related to programmatic effort in the facility

Initially, no GPP costs are anticipated but, to keep abreast of technology, presently undefined alterations will likely be required in the future.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Strategic defenses facility, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 86-D-104

3. Date A-E work initiated: 2nd Qtr. FY 1986

3a. Date physical construction starts: 3rd Qtr. FY 1987

4. Date construction ends: 3rd Qtr. FY 1990

5. Previous cost estimate: $70,000
Date: 1/85

6. Current cost estimate: $ 70,000 a/
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 4,000	$ 2,000	$ 2,000	$ 1,000
1987	13,000	15,000	15,000	8,000
1988	15,000	15,000	15,000	14,000
1989	3,000	3,000	3,000	10,000
1990	0	0	0	2,000

8. Brief physical description of project

This project provides for the construction of heavy laboratory space suitable for research and development (R&D) of directed energy weapons in the form of particle beams, x-ray lasers, microwaves, and kinetic energy (i.e., high velocity projectiles), light laboratory and office space maintenance facility for field engineering instrumentation vans, an instrumentation van modification and check-out facility, a radioactive experiment decontamination facility, and paved parking and storage areas.

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a/ The Conference Committee report accompanying Public Law 99-145 included language which stated that Congress expected cost sharing of this project with the Department of Defense's Strategic Defenses Initiative Organization. The Department of Energy's share of the construction costs is $35,000,000. The financial schedules in sections 7 and 12 reflect the $35,000,000. The details of the cost estimate in section 10 reflect the full $70,000,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Strategic defenses facility, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 86-D-104

8. Brief physical description of project (contd.)

The proposed strategic defenses facility (SDF) consists of approximately 246,000 square feet of gross space in three separate buildings. The first building is a universal high bay/low bay laboratory building with approximately 75,000 square feet of space with dual bridge crane coverage in the high bay. Multiple directed energy machines will have individual, local, relocatable radiation shielding to allow for equipment rearrangement with only minor disruption to other experiments. The high bay/low bay laboratory building also contains light laboratory space for support facilities, including mechanical and electrical equipment rooms for conventional facility electrical distribution and heating, ventilating, and air-conditioning systems, multiple data acquisition/data processing systems, and control/monitor systems to support the high bay experiments. The second building will be a multistory office/light laboratory with a full basement of approximately 165,000 square feet. This building will have a modular design to facilitate varying the size of laboratory and office spaces in minimum time and at low cost as requirements change. This building will be four stories high with basement, mechanical penthouse, and conference facilities. The third building is a maintenance and mechanical building of approximately 6,000 square feet, having a maintenance shop area for instrumentation vans, a boiler room, and a underground test experiment decontamination facility.

The high bay/low bay laboratory and the maintenance and mechanical building will be constructed of prestressed, precast concrete wall and roof panels with integral insulation, and the office/light laboratory will be constructed of cast-in-place concrete structural frame with prestressed precast walls and floors. A built-up roof over insulation panels will complete the building shells. Special insulating liquid storage will be provided in a minimum sized tank farm. Future requirements will be satisfied by exercising a preplanned expansion of the existing simulation technology laboratory liquid storage/process/transfer facility.

Site work will consist of paved streets and a parking area within the complex and extension of the perimeter fence. Utilities, including water, sewer, underground power, communications, and natural gas will be extended from existing nearby utility systems.

9. Purpose, justification of need for, and scope of project

Justification for the SDF is based on the fact that future United States strategic defensive systems will require new laboratory space to conduct experimental research on various directed energy weapon concepts. Laboratory space does not presently exist at Sandia National Laboratories, Albuquerque, to support strategic defense initiative (SDI) experimental research without cancelling existing high-priority programs. Research conducted in the SDF will explore the basic physics issues and will treat initial technical feasibility of concepts for particle beams, x-ray lasers, microwaves, and kinetic energy weapons. Evaluation of the utility of the various advanced defensive-directed energy weapons concepts will be based on theoretical/experimental lethality characteristics, vulnerability susceptibility to postulated hostile environments, and their cost effectiveness. Complete evaluation will require both laboratory and underground nuclear effects experiments.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Strategic defenses facility, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 86-D-104

9. Purpose, justification of need for, and scope of project (contd.)

As presently defined, the SDF will provide space for both the SDI experimental program and the field engineering capability necessary to support the SNLA underground test program. Colocation of the staff associated with these two programs will create a synergistic effect beneficial to both programs. Implementation of directed energy weapons research and underground nuclear test experiments require several common areas of technology that previously have been separated at SNLA. One area of common technology is high speed data acquisition from experiments exposed to hostile environments. Radiation effects on data sensors and data transmission cables are extremely important. Both programs have been working on the development of very high speed, data recorders to support similar recording requirements. The underground test field engineering experience will be required to design and implement some of the SDI experiments planned for the SDF laboratory in Albuquerque and at the Nevada Test Site (NTS) in Nevada.

In the development of SDI technology, particle beam acceleration, plasmoid formation and propagation, and electrical energy sources will have to be studied. This facility will allow experiments to increase the understanding of accelerator operation and scalability; plasmoid formation, stability and propagation; investigation of issues related to underground experiments and development of advanced sources of directed energy; and research into the construction of compact, lightweight accelerators with work on compact accelerator cavities, switching technology, dielectrics, and power conditioning.

The SDF facility is also required to support x-ray laser experiments and laser lethality issues; to develop improved high-frequency and electromagnetic simulation testing capabilities to be applied in determining the vulnerability of complex weapon systems; and to develop advanced kinetic energy weapons testing capabilities in the areas of projectile survivability and launch facilities with realistic projectile weights and volume.

In addition to the development of directed energy-related weapons, this facility will house the engineering and field test support staff for weapons and weapons component tests at the NTS. Currently, many of the staff assigned to these activities are housed in temporary, substandard, and energy-inefficient quarters at widely scattered locations. This facility will also provide adequate docking facilities (which currently do not exist) to repair and modify NTS recording trailers between underground test shots. The SDF facility will also provide environmentally safe laboratory space for post-shot examination of contaminated and radioactive experiments exposed in underground effects tests which do not exist.

The FY 1987 funding will initiate construction of the building including site preparation, structure, and utilities. Design will continue on the special equipment to be housed in the new facility. Procurement of some long lead-time equipment will also be accomplished.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Strategic defenses facility, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 86-D-104

10. Details of cost estimates a/

	Item Cost	Total cost
a. Engineering, design, and inspection		$ 8,400
(1) Facility engineering at approximately 13 percent of construction costs, item b	$ 3,400	
(2) Equipment engineering at approximately 22 percent of special equipment costs, item e	5,000	
b. Construction costs		24,500
(1) Improvements to land	1,200	
(2) Buildings		
(a) Light laboratory and office building, approximately 165,000 square feet at about $87 per square foot	14,300	
(b) High/low bay building, approximately 75,000 square feet at about $108 per square foot	8,100	
(c) Maintenance and mechanical building, approximately 6,000 square feet at about $83 per square foot	500	
(3) Utilities	400	
c. Standard equipment		4,100
d. Relocation of existing equipment		1,900
e. Special equipment, including accelerator components, data acquisition, control-monitor, and diagnostic equipment		22,100
Subtotal		61,000
f. Contingency at approximately 15 percent of above costs		9,000
Total estimated cost		$70,000

11. Method of performance

Design and procurement of the conventional facilities will be performed under negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Strategic defenses facility, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 86-D-104

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	$ 1,000	$ 8,000	$ 14,000	$ 10,000	$ 2,000	$ 35,000
(b) Inventories	0	300	500	2,000	500	3,300
Total facility costs	1,000	8,300	14,500	12,000	2,500	38,300
2. Other project funding						
(a) Conceptual design costs	30	0	0	0	0	30
(b) Other project related funding	0	2,000	3,000	3,000	2,500	10,500
Total other project funding	30	2,000	3,000	3,000	2,500	10,530
Total project funding (item 1 & 2)	$ 1,030	$ 10,300	$ 17,500	$ 15,000	$ 5,000	$ 48,830

b. Other related funding requirements (estimated life of project: 50 years)

1. Facility operating costs	$ 1,100
2. Programmatic operating expenses directly related to the facility	6,000
3. Capital equipment not related to construction, but related to the programmatic effort in the facility	500
4. GPP or other construction related to programmatic effort in the facility	100
Total other related costs	$ 7,700

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Total facility costs

      (a) Inventories, start-up supplies, and spare parts for special equipment are estimated at $3,300,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Strategic defenses facility, Sandia National Laboratories, Albuquerque, New Mexico
2. Project No.: 86-D-104

13. Narrative explanation of total project funding and other related funding requirements (contd.)

    2. Other project funding
        (a) Conceptual design costs of $30,000 was necessary to develop budget-quality cost estimate and construction schedule.

        (b) Research and development funding of $10,500,000 to supplement Title II for the development of a design to accommodate highly specialized equipment is required.

    b. Total related funding requirements
    1. Facility operating costs
        (a) These are the costs of unrecoverable materials and expenses used during operating and maintenance activities which include chemicals, gases, lubricants, waste disposal, and maintenance of steam and condensate lines.

    2. Programmatic operating expenses directly related to the facility
    These are the operation and maintenance staff requirements for the facility.

    3. Capital equipment not related to construction but related to the programmatic effort in the facility
    This represents an estimate of the equipment requirements to maintain the annual programmatic effort.

    4. GPP or other construction related to programmatic effort in the facility
    This represents an estimate of the construction requirements to maintain the annual programmatic effort.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Instrumentation systems laboratory, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 86-D-105

3. Date A-E work initiated: 2nd Qtr. FY 1986

3a. Date physical construction starts: 2nd Qtr. FY 1987

4. Date construction ends: 3rd Qtr. FY 1989

5. Previous cost estimate: None
Date:

6. Current cost estimate: $20,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 6,200	$ 3,100	$ 3,100	$ 900
1987	5,800	8,900	8,900	4,000
1988	8,000	8,000	8,000	8,400
1989	0	0	0	6,700

8. Brief physical description of project

This project will provide for a light laboratory and office building having four stories and a full basement, approximately 146,000 square feet gross area and will be a site adaption of two previously built buildings. The building will have a modular design to facilitate varying the size of laboratory and office spaces in minimum time and at low cost as requirements change. Movable partitions will be used throughout, except around fixed areas such as stairwells, elevators, and utility chases to facilitate rearrangements. Service areas, including stairs, toilets, and elevators will have masonry unit walls and gypsum board ceilings. Exterior walls will be insulated precast concrete with heat reducing glass windows.

The heating, ventilating, and air-conditioning systems include a double duct, variable air volume (VAV) perimeter heating/cooling system, and a core or interior single duct VAV system. Interior plumbing systems will include sanitary waste, domestic hot and cold water, compressed air, natural gas, and chilled water supply and return. Exhaust will be provided by utility fan sets on the roof with exhaust ducts installed in the utility chases. Lighting in the office and lab areas will be designed for approximately 70 footcandles with switches to allow for task lighting. A Technical Control Center (TCC) will be installed to provide connections to the Sandia Computing Communications Network. This TCC will be the focal point for all computer communications within this building and to the rest of the Sandia complex. New equipment will include a Thermal-Vacuum System for Satellite Systems Testing.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Instrumentation systems laboratory,
Sandia National Laboratories,
Albuquerque, New Mexico

2. Project No.: 86-D-105

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8. Brief physical description of project (contd.)

Exterior utilities will include a primary electric feeder, signal duct, steam and condensate lines, water, natural gas, and sanitary sewer. Area improvements will include storm drain inlets, paved parking, and service and driveway areas. Construction will be designed to conserve energy.

Major technical programs to be located in this new facility include: (1) development of telemetry systems to support weapon joint test assemblies (JTA) and flight evaluations; (2) weapon aircraft compatibility interfacing; (3) satellite instrumentation system development associated with nuclear burst treaty verification and monitoring; (4) development of unique new instrumentation systems for verification, diagnostic, and (5) new strategic defense initiative instrumentation activity in support of target tracking, focusing, orientation, and damage assessment.

The $1,000,000 in new equipment will provide, among other things, a needed second thermal vacuum chamber for the verification and control satellite program. Before the existing thermal vacuum chamber is dismantled and moved, the new chamber must be operational to support the delivery commitment schedule. The chamber consists of a thermal shroud inside the vacuum holding wall with controls, forepumps, and cryogenic molecular pumps external.

The FY 1987 funding will continue construction of the structure, procure long-lead items to be installed in the building, and initiate Titles I and II design of the occupancy phase of the project.

9. Purpose, justification of need for, and scope of project

Reliability testing of future nuclear weapon systems, such as the TRIDENT II missile and the B-61 bomb, Mods 6 and 8, requires major technology and development advances in order to permit monitoring more weapon functions during test firing of configurations which, additionally, must be more representative of actual war reserve (WR) weapons. This instrumentation technology must be developed simultaneously with the weapons.

Weapon JTA/Flight Telemetry Systems

The necessity for system level tests such as JTAs, that JTAs should be as identical to the WR weapon as possible and must yield a complete set of credible diagnostic measurements is clear. Meeting the contradictory goals of completeness and minimum intrusion requires sophisticated mechanical and electrical instrumentation designs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Instrumentation systems laboratory,
Sandia National Laboratories,
Albuquerque, New Mexico

2. Project No.: 86-D-105

9. Purpose, justification of need for, and scope of project (contd.)

As nuclear weapons have gained new capabilities, such as advanced arming, fusing and firing systems, and comprehensive security and safing systems; the flight instrumentation to measure system reliability has also grown in complexity. Modern telemetry systems will include an order-of-magnitude more active devices than in current systems. They enable encoding and broadcasting of the outputs of several hundred sensors throughout the weapon system being tested. Future instrumentation systems must use multi-microprocessors and specialized sensors to monitor the performance data essential for proper and complete reliability assessment. This technology will not only be a necessary component in development testing.

High performance reentry vehicle (RV) systems, such as the TRIDENT II, create special requirements for the JTA telemetry. The instrumentation must be comprehensive, since the systems cannot be recovered for laboratory examination. Numerous sensors must be distributed throughout the RV. The data from these sensors must be collected, encoded, processed for data compression, and recorded to be broadcast after the extended blackout (associated with its high performance reentry) and obviously before water entry.

Laboratory facilities are inadequate for the new technology microprocessor based telemetry development. Failure to provide adequate, timely facilities will significantly increase the risk of development problems in JTA telemetry and, consequently, will increase the potential for stockpile weapons having undiscovered problems.

Weapons/Carriers Compatibility

There is concern for subtle interactions between the weapon electronics and the extensive and complicated electronics of modern aircraft. Communication with all weapons on board is through this combined software and hardware system. It is the Department's responsibility to ensure this interface works correctly, and to anticipate, analyze, and answer all questions in real-time when abnormal displays about the on-board nuclear weapon stores are encountered. This new task is much more demanding than for older aircraft for which communication is accomplished by simply rotating switches in both the weapon and aircraft. Future weapon safety devices requiring unique signals (specified sequences of pulses) and software-driven avionic electronics now make the guaranteeing of weapon and aircraft compatibility a much more challenging task. Laboratory space is urgently needed for development of computer-based simulators for this task and is needed in time to support operational status of modern strategic aircraft being developed.

Providing adequate laboratory space for this activity will assure the Department's ability to carry out its responsibility to the Department of Defense (DOD) in maintaining the nation's nuclear weapons stores.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project:	Instrumentation systems laboratory, Sandia National Laboratories, Albuquerque, New Mexico	2. Project No.:	86-D-105

9. Purpose, justification of need for, and scope of project (contd.)

Verification and Control

The Department's interests in highly reliable instrumentation and sensors for the weapons program strongly parallel those of the Department's International Security Affairs program in its satellite applications. Developments in either arena provide complementary benefits to both programs.

For several years there has been a severe need for more specialized laboratory space, dust-controlled "grey" rooms, thermal-vacuum chambers, etc., to meet the requirements of expanding verification and control technology (V&CT) activities aimed at monitoring and verifying international compliance with provisions of the Limited Test Ban Treaty (LTBT). Earth and endoatmospheric monitoring is accomplished by satellite instrumentation whose development at SNLA is co-funded by the Department of Energy (DOE) which emphasizes optical sensor development, and by the DOD which supports the associated data-handling hardware and software development. DOD provides funds for integration of all DOE-provided instrumentation on DOD satellites. Originally, these latter instruments were to be provided by industry, but commercial sources were unable to meet DOD requirements.

The V&CT program funded by DOE is already evolving plans for satellite instrumentation to include strategic defense initiative (SDI) measurements.

DOE (Sandia) is currently hampered in accomplishing its mission as the national center for development of nuclear burst verification and reporting systems for satellite applications because of the inadequate and scattered space. All systems after 1989 will be launched by the space transport system and will require additional testing in order to qualify them for manned space flights. Sandia will be unable to meet its obligations to both DOD and DOE without additional laboratories, grey rooms, and thermal vacuum chambers.

Special Laboratories

Electronic assemblies for telemetry and satellite applications require specialized laboratories. Assembly of microelectronic devices requires a controlled environment (clean, dry, and static-free). With LSI chip features smaller than five microns wide, assembly air must be thoroughly filtered and dried. The presence of particles or moisture destroys devices when voltage is applied; under the best of circumstances this requires rework and, under all circumstances, it reduces the probability of successful performance.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Instrumentation systems laboratory,
Sandia National Laboratories,
Albuquerque, New Mexico

2. Project No.: 86-D-105

9. Purpose, justification of need for, and scope of project (contd.)

Extensive test equipment and computer-aided engineering (CAE) workstations are required to develop and evaluate flight-telemetry designs. This equipment also must be in a controlled environment (temperature, moisture, and dust), which is impossible to maintain in warehouses or other substandard work environments which cause equipment downtime and reduced operating life.

Satellite instrumentation development will need new specialized laboratories and additional equipment and procedures in order to meet increased safety certification and reliability testing that will be required for manned space launches in 1989. This requires additional temperature-cycling of payloads under high vacuum conditions, clean and grey room space for certified integration, calibration and testing of subsystems and other safety-critical components, and for the controlled modification and repair of production-quality instrumentation.

Approximately half of the people directly involved in these activities occupy mobile offices, temporary buildings, and World War II Butler-type buildings, all of which are substandard, wasteful of energy, costly to maintain, and completely unsuitable for modern laboratory activities involving microelectronics. Nineteen of these buildings will be surplused as a result of this construction.

The other half work in overcrowded laboratories. This problem has grown acute as detailed above because:

--Telemetry development for stockpile verification requires CAE, test equipment, and clean assembly which cannot be accommodated in present facilities.

--The compatibility of the modern bomb (and other weapons) with the modern aircraft (and other carriers) requires space for computer-based simulators.

--Those SDI instrumentation needs which are closely coupled technologically to the above activities need colocated laboratory space to promote desired synergism.

--The satellite-based verification and control program needs new space for grey rooms, thermal chambers, and testers to meet the 1989 requirements for manned space transport launch.

--Activities in V&CT and SDI are so technologically similar to those of the weapons activities JTA program that colocating these three functions will directly benefit the weapons activities through the synergistic interaction of these three groups. For example, electronic devices and circuits that are flight qualified by these groups can be utilized by the JTA program.

The instrumentation systems building is a high priority project which is critically needed by the weapons complex.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Instrumentation systems laboratory,
Sandia National Laboratories,
Albuquerque, New Mexico

2. Project No.: 86-D-105

10. Details of cost estimates a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 7 percent of construction costs, item b		$ 1,100
b. Construction costs		11,200
(1) Site improvements	$ 300	
(2) Building construction, approximately 146,000 square feet at about $70 per square foot	10,200	
(3) Utilities	700	
c. Equipment		5,800
(1) Standard equipment	1,000	
(2) Relocate existing equipment	4,800	
Subtotal		18,100
e. Contingency at approximately 10.5 percent of above costs		1,900
Total estimated cost		$20,000

11. Method of performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction and procurement will be performed under a negotiated fixed-price contract awarded on the basis of competitive bidding.

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Instrumentation systems laboratory,
Sandia National Laboratories,
Albuquerque, New Mexico

2. Project No.: 86-D-105

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	$ 0	$ 900	$ 4,000	$ 8,400	$ 6,700	$20,000
Total facility costs	0	900	4,000	8,400	6,700	20,000
2. Other project funding						
(a) Conceptual design costs	20	0	0	0	0	20
Total other project funding	20	0	0	0	0	20
Total project costs (items 1 and 2)	$ 20	$ 900	$ 4,000	$ 8,400	$ 6,700	$20,020

b. Other related funding requirements (estimated life of project: 50 years)	
1. Facility operating costs	$ 1,200
2. Programmatic operating expenses directly related to the facility	34,500
Total other related annual funding requirements	$35,700

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project costs

      (a) Conceptual design costs
      A conceptual design was prepared for this project at a cost of $20,000.

b. Other related funding requirements
   1. Facility operating costs

   Facility operating costs include utilities and costs of unrecoverable materials and expenses used during operating and maintenance activities. Includes chemicals, gases, lubricants, waste disposal, and maintenance.

   2. Programmatic operating expenses directly related to the facility

   Programmatic operating expenses include the operation and maintenance staff requirements, including approximately 345 persons at $100,000 per year per person.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Laboratory Data Communications Center, Los Alamos National Laboratory, Los Alamos, New Mexico
2. Project No.: 86-D-106

3. Date A-E work initiated: 1st Qtr. FY 1986
3a. Date physical construction starts: 3rd Qtr. FY 1986
4. Date construction ends: 4th Qtr. FY 1988
5. Previous cost estimate: None
Date: None
6. Current cost estimate: $25,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 3,000	$ 1,000	$ 1,000	$ 500
1987	12,000	14,000	14,000	7,500
1988	10,000	10,000	10,000	17,000

8. Brief physical description of project

The facility to be constructed is a new four-story building of approximately 90,000 square feet in area and Uniform Building Code (UBC) Type II fire-resistive construction. Approximately 68,000 square feet of raised access floor will be included. Demountable walls will be constructed on the raised access floors to facilitate future equipment installation and reconfiguration. The proposed facility will be a functional adjunct to the Central Computing Facility (CCF). However, the fire protection and security requirements dictate that the Laboratory Data Communications Center (LDCC) be in a separate building within required proximity of 300 feet (cable length) to the CCF. The proposed facility will provide expansion capability for projected computing and telecommunications growth for the next decade.

The following additional physical descriptions are provided to better describe the functional needs of the project:

The lower floor (first level) is to be of concrete slab construction and will contain building and computer support equipment. This equipment includes several load center unit substations; switching and protective equipment; electrical motor generator systems; an uninterruptable power supply (UPS) providing 15 minutes backup power for specific equipment; a signal cable vault to serve the private automated branch exchange (PABX); a battery room for the UPS and battery backup for the PABX equipment; and the heating, ventilating, and air-handling systems (HVAC) equipment, including chiller units and associated pumps, piping, and controls. This area will also provide space for a receiving and shipping area and communications maintenance vehicle

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Laboratory Data Communications Center,
Los Alamos National Laboratory,
Los Alamos, New Mexico

2. Project No.: 86-D-106

8. Brief physical description of project (contd.)

dispatch. This floor will be constructed at grade level and will be approximately 21,000 square feet, sized to accept future increases in mechanical-electrical support equipment.

The second floor (second level) will be approximately 21,000 square feet, entirely of raised access floor construction. This level will be used primarily for next-generation Class VII and Class VIII supercomputers. Major computers are located at this level to minimize output cable lengths and the dedicated compressor-chiller piping distance. By suitable networking, these computers will be utilized as integral parts of the CCF "worker machine" inventory. This level, in effect, expands the CCF super-computer area, utilizing the CCF I/O (input-output) control and output processing equipment. (Major computers for this level are not a part of this construction project request.) The floor of this level must be able to support the floor load of 300 pounds per square foot for the supercomputers.

A pedestrian passageway will connect the second level of the LDCC to the second level of CCF. This passageway will be 6,000 square feet, providing approximately 5,000 square feet of office space and accessible interconnecting signal cable ducting between the two buildings.

The third floor, to be referred to primarily as the networking area, provides a raised access floor of approximately 21,000 square feet for terminals, ports, communications lines, port switches (computers), and worker computer concentrators. The networking function switches various data-rate links within the integrated computer network (ICN), performs the network security controller function, and switches high data-rate channels to distributed (outlying) processing stations served by the high data-rate extended network (XNET) system. Laboratory space for maintenance, preoperational setups, and checkout and necessary support offices is provided. (Funds for networking equipment are not included in this construction project request.)

The upper floor (fourth level) will be approximately 21,000 square feet entirely of raised access floor construction, including office and integrated voice/data communications areas. This level will be the PABX switching center, as well as the location from which all future site telephone operations and maintenance will be directed. Data communications, transmitted by means of telephone circuits, are necessarily a part of this operation and are functionally related to the third floor networking system. Laboratory maintenance areas and necessary support offices will be provided.

The roof area, above the fourth level, will be constructed to support possible roof-mounted mechanical equipment, such as air-handling equipment. Extension of the freight elevator to the roof level will be considered.

The facility, at its anticipated full capability, will require an extensive utility load; primarily electrical power and cooling capacity. The cooling requirement exceeds present cooling-tower capability, and additional cooling-tower capacity and cooling water supply and return lines are included in the cost estimate. Initial capability is sized for an estimated

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project:	Laboratory Data Communications Center, Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 86-D-106

8. Brief physical description of project (contd.)

ten-year growth. Additional 13.2-kV underground power distribution lines (including back-up alternate routing) will be required. Initial capacity is sized for an estimated ten-year growth.

Fire protection will be provided in all areas by a wet-pipe sprinkler system and an automatic Halon system in subfloor and chase areas. Cable chase areas will allow floor-to-floor wiring penetration but will provide between-floor fire separation. A smoke control or exhaust system and fire-rated compartmentalization will be considered.

The facility will be in a secure controlled-access area. Security is required, not only because classified data will be handled within the facility, but physical security of network equipment, data communications, and system support equipment is required. A secondary security system within the building will allow controlled access to operating areas on all levels. This system will include guard stations and personnel monitoring systems.

Standard equipment will include passenger elevator, freight elevator, laboratory work benches, and minor furnishings.

A 200-car parking lot will be constructed of an asphalt cement surface in a location compatible with the Long Range Site Development Plan and the Five-Year Implementation Plan. A tunnel will be constructed for pedestrian traffic from the parking lot across a major thoroughfare to the building.

FY 1987 obligations will include: Title I and Title II design for the building, and procurement and installation of cooling tower, installation of cooling water supply and return lines, installation of primary and backup 13.2 kV underground power, rerouting of drainage, initial site clearing, clearing area for new security fencing, and parking lot construction. Every effort will be made during Title I and II to reduce building costs for this facility as well as increase the effective utilization of interior space.

9. Purpose, justification of need for, and scope of project

The objectives of this project are:

- o To alleviate rapidly developing space limitations at the Central Computing Facility (CCF).
- o To provide space for onsite switching for the Laboratory Telecommunications System, including its operation and maintenance.
- o To improve the utilization of the Los Alamos National Laboratory (LANL) computing resources significantly by providing connectivity to these resources for the Laboratory staff requiring connections.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Laboratory Data Communications Center,
Los Alamos National Laboratory,
Los Alamos, New Mexico

2. Project No.: 86-D-106

9. Purpose, justification of need for, and scope of project (contd.)

o To provide a facility designed to accommodate computing and communications growth projected for the next decade.

The use of high-speed computers and mathematical models to simulate complex physical processes has been and continues to be the cornerstone of the weapons design program. State-of-the-art computing and data communications are essential for meeting national security program goals and commitments.

LANL is now approaching a crisis because the physical plant capacity to support computing and data communications equipment has been overextended. The LDCC is required to fill this need by providing space to house new supercomputers beginning in FY 1989.

Long-range plans have been structured to provide for growth in computer and data communications capability in phase with program requirements. At present, 85 percent of computing resources are used for nuclear weapons and defense-related activities. These activities are now expanding because of major new advanced weapons design programs and a very rapid growth in strategic defense technology research, which will require significantly increased computing capability. The existing Central Computing Facility will soon have neither the space nor the supporting services, such as electric power and cooling, for the computing and data communications equipment that is planned to support program needs. The LDCC is urgently needed to provide this space and these services.

a. Major computer acquisitions planned for the time frame FY 1986 through FY 1991 include four Class VII and two Class VIII systems. Older, less capable machines--beginning with the Control Data 7600s--will be retired or relocated to other Department of Energy sites. However, by the end of FY 1988, all available space--including remaining office areas modified for computer use--will be completely occupied and continuation of the acquisition plan will not be possible. Additional space will be needed for the periodic upgrade of important ancillary equipment, such as the common data file system and the printing and graphics production system, to keep pace with the power of the computers. The LDCC is essential to provide that space.

b. It is through the data communications network that the Laboratory staff uses the computers. That use includes access to the machines to prepare programs, submit jobs, monitor work underway, interact with running programs, and edit output. The growing weapons program emphasis on computer-aided design and engineering involves transmission of great quantities of weapons product definition data between central computers and design workstations, and between Los Alamos and other weapons laboratories and production sites. The network transfers data files between the central data storage facilities and remotely located minicomputers and workstations. It transmits to the staff the results of computations, and it serves technical, administrative, and management personnel as the Laboratory's management information system. Without the space for data communications provided by the LDCC, the needed growth in this area beyond FY 1988 will not be possible.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Laboratory Data Communications Center, Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 86-D-106

9. Purpose, justification of need for, and scope of project (contd.)

c. While data communications growth and enhancement are emphasized, the LDCC will also accommodate needed improvements in voice and video communications facilities. Reflecting technology trends and the modern approach to efficient and cost-effective communications, the Laboratory plans the implementation of an integrated communications network, including central switching, to encompass the various forms of information transmission. The new space provided by the LDCC is an essential element of these plans because space otherwise does not exist. The LDCC will be the operational center for the integrated telecommunications system and the directional center for its maintenance. Improved communications security will be afforded by location of the switching for the Laboratory telecommunication network inside a secure area. The existing switchgear is presently located in a facility in downtown Los Alamos.

d. Our projection is that the LDCC will satisfy the Laboratory's requirements for its intended functions through the year 2000.

10. Details of cost estimate

	Item Cost	Total Cost
a. Engineering, design, and inspection		$ 2,100
(1) Facilities at about 11 percent of construction costs less Item b.(4)	$ 1,650	
(2) Special facilities equipment at about 11 percent of Item b.(4)	450	
b. Construction costs		18,600
(1) Improvements to land, including site clearance, drainage, security fence, and LDCC parking lot	530	
(2) Building, approximately 90,000 square feet at about $148 per square foot (Data Communications Center)	13,330	
(3) Other structures (access tunnel and guard station)	140	
(4) Special facilities; computer electrical and cooling systems, computer-data cabling, and utility connections	4,010	
(5) Utilities, including power, cooling water supply and return, cooling towers	590	
c. Standard equipment, including elevators and laboratory benches		450
Subtotal		21,150
d. Contingencies at approximately 18 percent of above costs		3,850
Total project cost		$25,000

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Laboratory Data Communications Center,
Los Alamos National Laboratory,
Los Alamos, New Mexico

2. Project No.: 86-D-106

11. Method of performance

Design and inspection for the facilities will be performed under a negotiated architect-engineer contract. Some FY 1986 design/build and inspection will be performed by the operating contractor. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and contracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and related funding requirements

	Prior Years	FY 1986	FY 1987	FY 1988	Total
a. Total Project Funding					
(1) Total facility costs					
(a) Construction line item	$ 0	$ 500	$ 7,500	$17,000	$25,000
(b) Plant engineering and design	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0
(d) Inventories	0	0	0	0	0
Total facility costs	$ 0	$ 500	$ 7,500	$17,000	$25,000
(2) Other project funding					
(a) Conceptual design	200	0	0	0	200
(b) Other project related costs	0	0	0	0	0
Total other project funding	$ 0	$ 0	$ 0	$ 0	$ 200
Total project funding (items 1 and 2)	$ 200	$ 500	$ 7,500	$17,000	$25,200

b. Other related funding requirements (estimate life of project: 25 years)

(1) Facility operating costs	$ 1,170
(2) Capital equipment not related to construction but related to the programmatic effort in the facility	12,000
Total other related annual funding requirements	$13,170

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Laboratory Data Communications Center,
Los Alamos National Laboratory,
Los Alamos, New Mexico

2. Project No.: 86-D-106

13. Narrative explanation of total project funding and other related funding requriements

a. Total project funding
   (1) Total facility costs. No narrative is required.

   (2) Other project funding
      (a) Conceptual design expenses were necessary to establish the specific design and construction features. No research and development is necessary for this project.
      (b) Other project-related costs. No narrative is required.

b. Total related funding requirements
   (1) Facility operating costs
   The annual facility operating costs are estimated for FY 1989 as follows: 90,000 square feet at $13.01 per square foot (based on the 1984 Laboratory average of $1.43 for janitorial, $2.50 for maintenance, and $4.36 for utilities services escalated by cumulative rates of 37 percent, 37 percent, and 75 percent, respectively).

   (2) Capital equipment not related to construction but related to the programmatic effort in the facility
   An expenditure of $50,800,000 is planned for FY 1989 for lease and/or purchase of two Class VII supercomputers, CAD/CAM Interactive Graphics, and an output station upgrade (see LANL Major ADP leases and purchases). An average annual expenditure of $12,000,000 is planned for years beyond FY 1989.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations

2. Project No.: 85-D-102

3. Date A-E work initiated: 2nd Qtr. FY 1985

3a. Date physical construction starts: 2nd Qtr. FY 1985

4. Date construction ends: 2nd Qtr. FY 1989

5. Previous cost estimate: $140,200
Date: 1/85

6. Current cost estimate: $152,300 a/
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 35,400	$ 38,150 b/	$ 36,996	$ 12,220
1986	65,400	35,400	36,554	41,900
1986 Sequestered	(0)	(400)	(400)	(0)
1987	30,350	57,600	57,600	51,700
1988	21,150	21,550	21,550	36,800
1989	0	0	0	9,680

8. Brief physical description of project

This project provides for the construction of new facilities; modifications, relocations, and additions to existing facilities; and new and replacement equipment for the nuclear weapons research, development, and testing (RD&T) facilities at the Los Alamos National Laboratory (LANL), the Lawrence Livermore National Laboratory (LLNL), the Sandia National Laboratories (SNL), the Nevada Test Site (NTS), and the North Las Vegas (NLV) ATLAS facilities. This project is a multiyear capital investment program to provide new or additional capabilities or capacities to revitalize the nuclear weapons RD&T complex. These new and modified

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a/ The total estimated cost (TEC) is based on completed subproject conceptual design. This project is the second phase in a multi-phased effort to revitalize the RD&T complex. Our current planning estimate for the revitalization effort is $1,925,000,000. This estimate is inclusive of the $79,240,000 included in Project 84-D-107, Nuclear Testing Facilities Revitalization.

b/ Includes $2,750,000 reprogrammed from FY 1985 weapons activities operating expenses.

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1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations

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8. Brief physical description of project (contd.)

facilities will replace or add to existing facilities that are overaged, deteriorated, overcrowded, or are inadequate to meet the capabilities required for the current and future weapons research and development (R&D) program and to achieve a long-term balanced test program.

Nevada Operations Office, Las Vegas, Nevada

Aerial Measurements Operations Facility - Las Vegas (TEC $27,900,000; FY 1985 funding $2,000,000; FY 1986 funding $5,000,000; FY 1987 funding $20,900,000)
Construction starts: 1st Qtr. FY 1987 1/; Construction ends: 4th Qtr. FY 1988

This subproject provides for a new Aerial Measurements Operations (AMO) facility. The proposed AMO facility will replace the existing facility located adjacent to McCarran Airport and will provide a 115,000-square-foot building, illuminated aircraft parking apron with tiedowns, taxi-way, paved vehicle parking, and all required roads and utilities. The buildings will provide space for offices, light laboratories, mechanical and electronic assembly, computer operations, photograph processing, plant and maintenance, general storage and warehousing, and aircraft maintenance and operations. Currently, the specific site has been determined to be located at Nellis Air Force Base, Nevada. The location will meet the following requirements: a 24-hour operational tower; 24 hour security; night landing capability; instrument landing system or very high frequency omni range capability; and access to get fuel storage. The runway will be of sufficient length and width to accommodate C-141 aircraft.

Vehicle parking area illuminations will be sufficient to accommodate closed-circuit security television monitoring. Approximately 4,600 lineal feet of 8-foot high security fencing will be utilized around the perimeter to delineate certain critical areas. In addition, a personal bridge for facility access and a hardened guard station will be required.

This facility is required to replace the existing facility located on Escondido Road in Las Vegas, adjacent to McCarran Airport. The need for this replacement arises from three factors: expanded program requirements; the inadequacy of the existing space as related to operational and fire protection requirements; and the pending condemnation of the existing facility due to a planned new runway at McCarran International Airport.

1/ Site preparation at Nellis Air Force Base.

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8. Brief physical description of project (contd.)

Aside from the programmatic and fire safety considerations, the existing facility will be condemned because of the planned airport expansion. Considering the period required to relocate prior to land condemnation, coupled with the expectation that construction costs will continue to increase, it is prudent to construct new facilities as quickly as possible consistent with reasonable and efficient construction planning.

The total estimated cost (TEC) of this subproject increased $3,500,000 to $27,900,000 from $24,400,000 due to further definition of site-related construction requirements and the addition of the U.S. Army Corps of Engineers (USACE) as construction manager to the project team. The additional site-related construction requirements are the result of a study conducted by the Nellis Air Force Base Commander and the identification of new site location for this facility.

The FY 1987 funding request will be used to fund facility construction, procure equipment, and support subproject USACE construction management.

Test Facilities Revitalization, NTS and NLV

This subproject will initiate revitalization at the NTS and NLV in five major functional areas: (1) reconfigure Forward Area camps to replace existing substandard, overcrowded camps and to free up prime test real estate; (2) develop Pahute Mesa by providing some permanent facilities, utilities, and improved roads; (3) test execution support by upgrading facilities to accommodate larger diameter devices and canisters; (4) replace common support facilities such as fire houses, health facilities, warehouses, and craft shops; and (5) initiate an effort to expand and replace personnel support facilities such as housing, dining halls, and recreation facilities.

(1) Develop Pahute Mesa

The objective of this development plan calls for: (1) the paving of the two access roads; (2) establishment of permanent materials and equipment storage facilities; (3) establishment of decontamination and heavy equipment service facilities; (4) upgrading of power systems to support multiple events; and (5) installation of a permanent water system along with supporting industrial, fire protection, and domestic requirements.

a. Pahute Mesa Road System, NTS (TEC $10,100,000; FY 1985 funding $2,500,000; FY 1986 funding $0; FY 1987 funding $3,800,000; FY 1988 funding $3,800,000)
Construction starts: 2nd Qtr. FY 1986; Construction ends: 4th Qtr. FY 1988

This subproject provides for upgrading the existing Pahute Mesa Road System to form a transportation loop connecting Yucca Valley to Pahute Mesa. The western portion of the proposed loop will be developed by improving Road 18-03 from its intersection with Airport Road westerly 2.4 miles to Buckboard Mesa Road, and Buckboard Mesa

8. Brief physical description of project (contd.)

Road from its intersection with Road 18-03 northerly 11.6 miles to Pahute Mesa Road. The eastern side of the loop will be completed by improving Pahute Mesa Road from its intersection with Buckboard Mesa Road in Area 20 southeasterly some 22 miles to its intersection with Stockade Wash Road. The project will involve building up, realigning, widening, paving, and stripping roads 18-03 and Buckboard Mesa. It will also entail realigning, resurfacing, and stripping Pahute Mesa Road. Initial construction will improve the northernmost five miles of Buckboard Mesa Road south of its intersection with Pahute Mesa Road.

The Pahute Mesa Road System provides access to Pahute Mesa Test Areas. An expanded weapons test program is planned to be conducted on the Mesa. Many sections of the existing paved miles are heavily potholed and washboarded and the rest is unpaved. These conditions make travel unsafe at speeds above 25 miles per hour. The deterioration and unpaved roads increase fuel consumption, raise vehicle maintenance costs, and require long lead times for equipment deliveries to event sites. An increased testing level on the Mesa will require the transportation of approximately 500 personnel daily, along with support vehicle and equipment traffic, which makes paving the Mesa Road system a critical project if the Mesa is to be a major test area.

The TEC of this subproject increased $300,000 from $9,800,000 to $10,100,000, as the result of escalation adjustments due to zero funding in FY 1986.

FY 1987 is the second year funding for a three-year phased approach to upgrading the Pahute Mesa Road system subproject.

(2) Test Execution Support

The objective of this development plan calls for: (1) upgrading facilities' capability and capacity to handle additional and larger devices and canisters; and (2) upgrading facilities used for equipment research and fabrication, calibration, installation, and monitoring to service the proposed balanced test program.

(a) ATLAS High Bay Expansion, NLV (TEC $2,700,000; FY 1985 funding $2,700,000; FY 1986 funding $0; FY 1987 funding $0)
Construction starts: 1st Qtr. FY 1986; Construction ends: 4th Qtr. FY 1986

This subproject will provide a 140-foot by 80-foot enclosed assembly area between the existing ATLAS facility and the proposed staging assembly tower. This high bay expansion will be constructed of precast concrete panels attached to a structural metal support system. It will have a variable eave height stepping upward from 31 feet to 74 feet in 11-foot increments. The facility will also be equipped with two 30-ton cranes to provide the capability to assemble the number of canisters necessary to support planned testing levels. The demands of the long-term balanced weapons program dictate an increase in size, complexity, and quantity of canisters, which will

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1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations

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8. Brief physical description of project (contd.)

require an increase in the ATLAS high-bay facility floor space. This project will provide an addition to enlarge the facility by approximately 11,200 square feet.

The present high bay consists of approximately 23,000 square feet of floor space, 2,700 square feet of which are dedicated to canister assembly. The average canister section requires 700 to 800 square feet of open floor space during assembly. Under present conditions, only three canister section frames can be assembled or pre-aligned simultaneously. Two complex events, comprised of two canister sections each, cannot be assembled on the floor at the same time. Increased floor time requirements due to increased canister complexity tend to aggravate the situation. A continuing increase in the diagnostic complexity associated with an underground test requires each diagnostic canister to spend 30 to 40 percent more time on the high bay floor during assembly. In addition, the planned number of tests performed will require a significant increase in canister throughput. This subproject was fully funded with the FY 1985 appropriation.

(b) Diagnostic Assembly Tower - LANL, NTS (TEC $4,900,000; FY 1985 funding $4,900,000; FY 1986 funding $0; FY 1987 funding $0)
Construction starts: 1st Qtr. FY 1986; Construction ends: 1st Qtr. FY 1987

This subproject will provide a portable diagnostic assembly tower for LANL's use at NTS. The tower will be a 20-foot by 20-foot by 200-foot space truss tower composed of five 30-foot modules, one 27-foot module, and one 23-foot module. In addition, there will be an electric-driven rack and pinion passenger/freight elevator with a 6,000-pound capacity independent support mast and a 500,000-pound capacity hydraulic hoist for moving racks to the vertical position.

The tower will provide for the assembly and alignment of diagnostic test equipment which collects data on nuclear weapons tests and provides a weatherproof work area for technicians, hardware, and specialized electronics equipment. A fixed amount of time is required for this process for each event, and this additional tower will allow work to be carried on for several events simultaneously. In addition, this tower is required to provide the added capacity to execute a balanced test program, as well as to provide the required capability to support the 98-inch diameter by 165-foot long diagnostic rack and nuclear device and the associated heavier weights.

Current towers will not accommodate the canisters planned for use in the program. Further, an additional tower is needed to support the additional number of tests to be conducted on the Mesa.

This subproject was fully funded with the FY 1985 appropriation.

8. Brief physical description of project (contd.)

(3) Personnel Support Facilities

The objective of this development plan calls for upgrading the form of housing, dining halls, and recreation facilities; the plan's initial phasing calls for the construction of dormitories at Mercury and Area-12.

Dormitories - Mercury and Area 12, NTS (TEC $3,500,000; FY 1985 funding $3,500,000; FY 1986 funding $0; FY 1987 funding $0)
Construction starts: 1st Qtr. FY 1985; Construction ends: 1st Qtr. FY 1986

This subproject continues the dormitory replacement activities initiated in FY 1984 under Project 84-D-107, and in FY 1985 will provide for the construction of two Type "A" dormitories containing 53 single occupancy 12-foot by 20-foot rooms with individual restrooms and shower facilities in a 2-story building and the initiation of design of a type "C" dormitory which is the next planned replacement activity. The buildings will contain a lobby, laundry, mechanical equipment room, janitor's closet, and facilities for the handicapped.

These 106 units will replace a portion of the current 4-bed/shared bath trailers. The trailer units to be replaced have exceeded their use life by 200 percent, are in violation of DOE fire regulations, and do not provide appropriate or adequate accommodations for personnel are on temporary assignment to NTS or who must stay on location because of work schedules and operating procedures. The NTS users and contractors believe that adequate, comfortable housing affects the caliber of personnel they are able to attract and retain to work on the nuclear weapons test program.

Improved accommodations are required at the NTS to provide adequate living quarters for scientific and professional personnel who are required to reside at the NTS on a recurring semipermanent basis and also to provide adequate quarters for the permanent Mercury population. Existing housing at Mercury consists of: old trailers; wooden communal-type dormitories; concrete block bachelor officer's quarters; and two-story, motel-type dormitories. The acceptable bachelor officer's quarters and motel-type facilities will accommodate only 230 persons. During the first nine months of FY 1983, the average monthly peak overnight population was 800 persons. Thus, the monthly peak population exceeds by approximately 350 percent the space available in acceptable facilities. The peak population during an augmented test program is expected to be approximately 1,100 and will severely aggravate the situation.

During peak activity periods, housing scientific and technical personnel in Mercury has two advantages over accommodations in the nearest motels, which are 65 miles away in Las Vegas. First, motel accommodations in Las Vegas would represent a substantial cost to the Government. Second, the travel time (about 2-1/2 hours per

8. Brief physical description of project (contd.)

day) has a negative effect on efficiency and productivity, especially when these personnel are on extended workdays.

This subproject was fully funded with the FY 1985 appropriation.

(4) Test Revitalization Capital Equipment, NTS and NLV (TEC $2,400,000; FY 1985 funding $2,400,000; FY 1986 funding $0; FY 1987 funding $0)
Construction starts: 1st Qtr. FY 1985; Construction ends: 2nd Qtr. FY 1986

This subproject will revitalize the capital equipment base of the nuclear weapons test complex with primary emphasis on the Nevada Operations Office (NV) Test Complex. It will provide the necessary capabilities and capacities to support an increased level of testing. The types of equipment to be provided include: heavy construction, vehicles, communications, shop, data recording, timing and firing, nuclear chemistry, underground test measurement, laboratory, and other test diagnostics.

This project continues revitalization of the capital equipment base at NV which was initiated in FY 1984 under Project 84-D-107. Equipment needs at NTS and NLV are important and, in many cases, critical to achieving a balanced testing program.

The NV equipment requirements cover a broad spectrum of items which include sophisticated diagnostic recording, communications, heavy equipment, security, automated data processing, office, and the largest vehicle fleet in the Department of Energy (DOE). There are over 45,000 items included in this inventory which, for the most part, is spread over 1,350 square miles of the NTS. Much of the equipment is subject to the climatological extremes of the desert environment, as well as ground shock from nuclear underground tests. A high percentage of the equipment is moved frequently over unimproved roads and rough terrain. All of these factors combine to reduce the useful life of NTS equipment. From the viewpoint of the laboratories, the same degradation has occurred in their equipment resources.

Recent years have seen significant advance in technology which should be used in diagnosing the performance of nuclear weapon designs. The use of digital equipment, new television cameras, fiber optic techniques, radiochemical detectors, and improved equation-of-state measurements could provide the weapons designer with a larger fraction of the information which is needed to improve weapon design.

The equipment requirement needs also take into account the planned increased test rate and the need to support the increased rate under a long-term balanced advanced physics and weaponization test program.

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Lawrence Livermore National Laboratory (LLNL), Livermore, California

a. High Explosives Applications Facility (HEAF), LLNL, CA (TEC $45,350,000; FY 1985 funding $8,000,000; FY 1986 funding $9,300,000; FY 1987 funding $16,600,000 FY 1988 funding $11,450,000)
Construction starts: 4th Qtr. FY 1985; Construction ends: 2nd Qtr. FY 1989

This subproject will provide for construction of a laboratory office building of approximately 102,000 square feet of floor space. A large portion of the facility (67,500 square feet) will include spaces for high explosive (HE) storage, precision shot assembly and instrumentation, contact and remote control HE operations in support of test firing, test cells for potentially hazardous HE studies, various sizes of enclosed firing chambers, control and diagnostic equipment, high-velocity gas gun, special shops, other small laboratories, and change rooms. The remainder of the facility will provide approximately 18,300 square feet of office, drafting, library, data reduction, and conference space for the HE program experimentalists and theorists. In addition, approximately 17,000 square feet of space will be required above the laboratories for mechanical and electrical equipment and gas expansion chambers.

Special equipment for operation of the HEAF will include a radiographic electron accelerator, electro-optical equipment, high-velocity gas gun, electronic instrumentation, data handling equipment, enclosed firing chambers (ranging from a few grams to multi-kg capacity), HE transfer containers, access control system, and a monitor system.

To maintain a strong and viable nuclear deterrent, the weapons laboratories have focused on these four areas: durability of our stockpile; reliability of our initiation systems; performance in terms of yield-to-weight ratio; and increased safety and its corollary, reduced vulnerability of our weapons.

HE technology is a common denominator which appears in an analysis of the needs of each of these areas. The HE system, consisting of a main explosive charge plus detonators, is used to implode the pit, making the nuclear explosion possible. HEAF will be a major factor in a vigorous HE research program from which we can expect major contributions to weapon performance, safety, and security. HEAF is a facility designed to provide us the testing capacity so that we can develop more reliable designs and materials.

The TEC for this subproject has increased $6,050,000, from $39,300,000 to $45,350,000, primarily as the result of escalation and higher costs due to split packaging of the construction contract and schedule extension resulting from reduced first and second year funding and the resiting of the facility.

The FY 1987 funding provides for the continuation of the construction phase, inspection, and some procurements.

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8. Brief physical description of project (contd.)

b. Tritium Facility Upgrade, LLNL, Livermore, CA (TEC $4,700,000; FY 1985 funding $700,000; FY 1986 funding $2,500,000; FY 1987 funding $1,500,000)
Construction starts: 3rd Qtr. FY 1986; Construction ends: 1st Qtr. FY 1988

This subproject will provide a 1,000-square-foot building equipped with pumps, blowers, surge tanks, catalytic converters, and replaceable absorption beds to serve as a standby recovery system. Modern gas processing equipment will be installed in the adjacent gaseous chemistry building to reduce releases of radioactive gases and minimize releases during emergency situations. A vacuum effluent recovery system will be installed in the same building and a building addition of approximately 5,700 square feet and the remodeled area, approximately 2,000 square feet, will provide offices, a library, and space for other activities.

Mechanical utilities, power, and communications lines available at the existing building will be relocated as required to accommodate the proposed addition and alterations.

Safeguards and security considerations have placed a requirement to accommodate a rooftop hardened guardpost with this facility. Structural and utility interfaces will be added to this project while the actual guardpost and installation will be provided for in a safeguards and security line item project.

The purpose of this project is to provide safety and monitoring control of tritium systems and to reduce tritium releases to the environment to as low a level as reasonably practical. The existing once-through-airflow system was designed to protect building personnel from exposure, and small releases of tritium to the atmosphere were tolerated. Even though operations are currently within applicable safety regulations and guidelines, it is anticipated that regulations, environmental, and political concerns will require more stringent control systems for this facility. A vacuum recovery facility will recover small quantities of tritium that are now released in a controlled manner. A standby recovery system will protect against a large tritium release in the event of an equipment failure.

This tritium facility is used to provide for the continuing support of device tests at the Nevada Test Site, filling glass microsphere targets for inertial fusion experiments, and basic research in the physical and chemical properties of tritium containing hydrogen isotopes. Because of the vital functions this facility performs, these safety improvements must be made to assure the continued use of this facility.

The TEC for this subproject has increased $500,000, from $4,200,000 to $4,700,000, as the result of reestimating the subproject based on most current data, escalation adjustments due to reduced FY 1986 funding, the addition of structural/utility interfaces for the guardpost, and a minor increase in building costs associated with a 500-square-foot building space increase.

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8. Brief physical description of project (contd.)

The FY 1987 funding provides for completion of the subproject.

Los Alamos National Laboratory (LANL), Los Alamos, New Mexico

Advanced Radiochemical Weapons Diagnostic Facility, LANL (TEC $7,900,000; FY 1985 funding $1,800,000; FY 1986 funding $5,000,000; FY 1987 funding $1,100,000)
Construction starts: 1st Qtr. FY 1986; Construction ends: 4th Qtr. FY 1987

The Radiochemical Diagnostics Laboratory will provide a 14,400-square-foot building west of the existing Radiochemistry Laboratory Building and will provide "clean" laboratory space for mass spectrometers isotope separator equipment, chemistry and standard chemistry laboratories, offices, stockroom, toilet/change rooms, and facilities equipment space. The laboratory space will include approximately 4,700 square feet of "clean" instrumentation space, approximately 2,300 square feet of "clean" chemistry space, and approximately 1,100 square feet of standard chemistry space. The laboratory support space of approximately 6,300 square feet will include office space, a stockroom, toilet/change rooms, data distribution room, air distribution systems space, and equipment room space to house extensive mechanical and electrical systems.

Present separators at LANL have neither the high-transmission efficiencies nor the large separation factors needed for state-of-the-art analyses. LANL's ability to respond either to the demands of a balanced test program or to provide the weapons designer with the maximum radiochemical data required for optimizing weapons design is, therefore, severely limited. Failure to provide this capability will severely limit the application of important diagnostic techniques in the analysis of the performance of nuclear weapons and will limit the weapons designer's ability to develop new designs.

This building and the new isotope separator equipment that is to be housed will revitalize the radiochemical weapons diagnostics program at LANL. Isotope separation of elements recovered from nuclear weapons debris has played an increasingly important role in the detailed analysis of device performance. This new facility will provide the opportunity for further expansion and development of the application of radiochemical detectors to the nuclear weapons program.

Radiochemical diagnostics have historically played a definitive role in the evaluation of weapons performance. The development of new radiochemical techniques, involving state-of-the-art mass spectrometric methods, has presented the laboratory with an opportunity to extend and improve its ability to diagnose and understand fully the performance of nuclear weapons tested underground in Nevada. This laboratory is for further expansion of this mass spectrometric capability leading to routine application to weapons diagnostics. The laboratory's "clean" facilities are an absolute necessity for the "mass spec detector" program. Delay in funding, or failure to fund, will delay or severely limit the application of important diagnostic techniques to the testing of nuclear weapons.

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8. Brief physical description of project (contd.)

The TEC of this subproject has increased $100,000, from $7,800,000 to $7,900,000, due to escalation as the result of reduced funding in FY 1986 and inefficiencies associated with the scheduled extension.

The FY 1987 request will fully fund the subproject and allow its completion. This project has been rescoped due to construction contractor bids being in excess of the government estimates. The rescoping to stay within estimated cost includes the reduction of approximately 1,100 square feet of floor space.

Sandia National Laboratories, Albuquerque, New Mexico, and Livermore, California

a. Weapons Laboratory Building, SNL, Livermore, CA (TEC $19,000,000; FY 1985 funding $5,800,000; FY 1986 funding $6,500,000; FY 1987 funding $6,700,000)
Construction starts: 3rd Qtr. FY 1985; Construction ends: 2nd Qtr. FY 1988

This subproject will provide a multistory general purpose laboratory building of approximately 77,000 square feet, consisting of light laboratory spaces, associated offices, and basement laboratory space plus equipment room. The project will include utility extensions and land improvements. This building will be a duplicate of the Safeguards Light Laboratory/Office building completed in FY 1980 in Albuquerque. The design has adapted the building to a new site, the structure has been modified for a different seismic zone, and the building entrances have been reworked. The equipment and support systems required to pursue state-of-the-art weapons R&D will be provided and will include special laboratory furniture and fume hoods, cooling systems for heat producing experiments and data equipment, environment containment and control systems such as chambers and glove boxes, and prefabricated clean rooms for dust-sensitive research. The building will also include a technical control center room to provide connections to the Sandia computing communications network. This center will be the focal point for all computer communications within this building and to the rest of the Sandia complex. Security alarms and physical protection systems will be installed and extended to the fire department and the security center.

SNLL requires a new laboratory building to correct a serious and growing deficiency in the site's facilities for weapons related research and weapons system development. This laboratory building will provide the facilities required for several applied research activities that have been at the forefront of weapon evolution: electronics, applied physics, and materials science. These activities will provide the technological basis for weapon improvements throughout the remainder of the century. Fundamental understanding of the involved phenomena and its application to mission oriented projects is the bedrock of the weapons program. It minimizes the possibility for technological surprise while creating new opportunities for United States systems--e.g., the components and structures for modern, small diameter devices for NATO artillery; providing weapons with some intelligence through use of microprocessors for improved operational capability, safety, and

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security; and the development of new materials for smaller and lighter systems which satisfy more stringent requirements. Providing modern state-of-the-art laboratories for these activities is vital for continued weapons development.

For the last 15 years, laboratory space at SNLL has been provided mainly by converting warehouse and office space into laboratories. Warehousing has been displaced to sheetmetal buildings. People have been moved from offices in permanent buildings to temporary substandard trailers and modulars. The result is that 30 percent of the weapons staff are in temporary quarters. Many are housed in overcrowded offices at scattered locations with poor services and inadequate utilities.

The acquisition and maintenance of temporary buildings and conversion of office and warehouse space to laboratories have been extremely costly. More importantly, because of limited adequate laboratory space, SNLL has not been able to evaluate adequately and apply critical processes which are needed for present and future weapon systems.

The TEC for this subproject has decreased $1,100,000 from $20,100,000 to $19,000,000 as the result of a favorable bid on a portion of the building construction.

The FY 1987 request will fully fund this subproject and allow completion of building construction, equipment procurements, and inspection.

b. Process Development Laboratory, SNL, Albuquerque, NM (TEC $21,100,000; FY 1985 funding $1,100,000; FY 1986 funding $6,700,000; FY 1987 funding $7,000,000; FY 1988 funding $6,300,000)
Construction starts: 4th Qtr. FY 1986; Construction ends: 1st Qtr. FY 1989

This subproject provides for the construction of a heavy laboratory and shop building of approximately 119,000 square feet gross area. Construction will include insulated metal panel exterior walls, concrete slab ongrade, steel stud-dry wall and demountable interior partitions and walls, poured-in-place concrete structural frame, and a lightweight steel roof structure with built-up roof. This laboratory shop and inspection area, approximately 77,000 square feet, will be a high-bay area. The office and common support area, approximately 77,000 square feet space, will be low bay. The basement and penthouse equipment room space is approximately 28,000 square feet. Beyond the typical heating, ventilation, and air conditioning and plumbing requirements will be special systems for gas handling and the exhausting of toxic materials and flammable gases.

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The SNL main machine shop building and the welding/sheet metal foundry building are both more than 20 years old. Since the construction of these facilities, a number of specialty process activities have become a major part of SNL development functions. These activities (ceramics, plastics, physical electronics, process analysis, hybrid microcircuits, electronic fabrication, etc.) have continued to grow in importance and size due to new weapon systems requirements for increasing amounts of componentry utilizing these newer technologies. Inherent in these materials and process areas is the need for greater cleanliness, closer environmental control, and safeguards against potential physiological hazards.

In the absence of new buildings tailored to the job requirements, these functions have been crowded into the machine shop buildings and in temporary, substandard buildings that include metal Quonset and woodframe-type World War II era structures. This substandard space does not meet current fire codes and, after numerous modifications, is of questionable structural integrity. In these areas, necessary processes cannot be performed within acceptable environmental standards. These hazardous processes include: (1) the handling of lead containing ceramic powders; (2) amines and other suspected toxic plastic formulations; (3) hydrogen gas furnace operations; and (4) other processes requiring special environmental controls.

Providing adequate ventilation and effluent discharge for the required environmentally safe operating conditions would be impractical from a cost and functional requirements standpoint in many cases and physically impossible in some of the present processing facilities. Environmental requirements will be a prime consideration and an integral part of the new facilities basic design.

Without this new facility, several programmatic impacts can be identified: future weapons designs will be jeopardized by inadequate understanding of state-of-the-art manufacturing techniques and materials now becoming available to the production complex; SNL will be unable to specify complete product design definition to the production agencies for SNL designed components; already limited capability to "backup" production agencies will diminish further; capability for producing classified prototypes to support system and component development will erode further; environmental health concerns about heavy metals could require termination of the ceramics production activity, thereby eliminating a stockpile materials source; and additional process capabilities cannot be added without further safety degradations.

Based upon completion of Title I, preliminary design, the square footage of the building has been increased by approximately 16,000 square feet. This increased square footage is primarily the addition of an equipment penthouse which has been provided without an increase in the total estimated cost.

The FY 1987 request is required to continue funding of building construction initiated in FY 1986 and provide for long-lead procurements and inspection.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations

2. Project No.: 85-D-102

8. Brief physical description of project (contd.)

c. Shipping and Receiving Facility, SNL, Albuquerque, NM (TEC $2,750,000; FY 1985 funding $2,750,000; FY 1986 funding $0; FY 1987 funding $0)
Construction starts: 1st Qtr. FY 1985; Construction ends: 2nd Qtr. FY 1986

This subproject provides for the construction of a shipping and receiving facility of approximately 50,000 square feet area, the building will be constructed of pre-engineered steel column and beam (or truss) frames with a metal panel roof system. The building will have a minimum 18 feet interior clear height and will contain some interior offices to provide support to the warehouse function. Paving will consist of a parking lot, access roads, storage areas, loading docks, and truck access to the building. Utilities include gas, water, sewer, and electrical service to the new building from adjacent site service. The building will have an automatic sprinkler system, security lighting, intrusion alarm system, fencing, and a combination fire alarm and evauation alarm system.

The present facility assigned to the shipping and receiving functions and related activities contains only 17,750 square feet. Both the receiving and packaging-shipping activities, because of volume of activity, require large processing and staging areas. The confines and congestion of the present facility require moving and handling items several times. This not only decreases the efficiency, but increases the chance of damage or loss of the items. Because of the size and bulk of some items, it is necessary to utilize open storage for both the shipping and receiving operations. Both pedestrian and vehicular traffic in or around these items cannot be controlled at the present location.

An additional concern has been the recent location of new buildings and security area population relocation in this area. The entry gate to the security area located in that vicinity has always been a high traffic gate. As a result of the additional facilities that have been built or are being built in that location, this traffic has greatly increased. The traffic of commercial carriers and local suppliers adds to this congestion. This creates not only traffic congestion, but also concerns for safety. These drivers are uncleared, which amplifies the problem for security.

The new facility will allow the shipping and receiving and related functions to be relocated to expanded space and segregated to provide more intense security and protection, and will allow a smoother, more efficient flow of the property and material as it is being processed and stagged.

The following is a summary of the FY 1987 request by location:

Nevada Test Site and North Las Vegas ATLAS Facility, Nevada	$24,700
Los Alamos National Laboratory, New Mexico	1,100
Sandia National Laboratories, New Mexico and California	13,700
Lawrence Livermore National Laboratory, California	18,200
Total	$57,700

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations

2. Project No.: 85-D-102

9. Purpose, justification of need for, and scope of project

A decade of minimal construction and capital equipment funding for weapons RD&T has resulted in a stagnation and, in some cases, an erosion in the capabilities for the RD&T capital asset base. This project is the first phase in a multi-phased effort to revitalize the RD&T complex. The planning estimate for this effort over a ten- or eleven-year period is about $1,850,000,000 in escalated dollars, including line item construction subprojects, minor construction subprojects (less than $1,000,000), and capital equipment.

The nuclear weapons RD&T program is made up of a highly complex set of activities extremely dependent on current and advanced technology facilities and equipment to meet its varied needs. In turn, the successful performance of the RD&T program contributes directly to the quality and reliability of the nuclear weapons stockpile. New weapon systems now require, in addition to unremitting requirements for reliability and performance, new safety and safeguards features. These standards require innovative physics concepts and designs, the development of new materials and material applications, and extension of both engineering and manufacturing technologies beyond the current "state-of-the-art." Without providing the facilities and equipment necessary for this RD&T effort, the United States risks losing its superiority in nuclear weapons technologies.

Revitalization effort was initiated in FY 1984 with Project 84-D-107, Nuclear Testing Facilities Revitalization. That project was defined based upon needs identified in a test study completed in January 1982. The study was conducted by a task force comprised of representatives from the Office of Military Application, Nevada Operations Office, and the three weapons laboratories. All aspects of the test complex capital asset base were critically reviewed during the study and priority resource requirements necessary to achieve and sustain a balanced, long-term test program in excess of the FY 1981 level of testing were identified.

Several factors have contributed to the current situation as it relates to testing facilities. One such factor is the history of the overall test program itself. The history has been one of great fluctuations and very dynamic programs. These programs have fluctuated over the years due to political uncertainties and shifts in national policy relating to underground nuclear testing and nuclear deterrence. Many of the NTS facilities are temporary and were built 10-20 years ago and are now completely overage and deteriorated. Within the laboratories, capital funding for facilities dedicated to the test program has been sporadic at best. Many facilities now in use were built originally for other purposes. Another factor is the combination of increased complexity and workload confronting the program. To a large extent, the requirements for information in the test program mirror the pace and scope of the underlying research and development effort. As designs become more complex and the frontiers of technology are pushed out further in the laboratories, more information of increasing detail is required from each experiment associated with a device test. Today's device tests are much more complicated than tests conducted 10 years ago. Couple this with an overall increase in the DOE and work for others testing workload and it becomes obvious that additional diagnostic capacity and capability will be necessary at the NTS and the laboratories if the test program is to continue to support the research and development process in a timely and effective manner.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations

2. Project No.: 85-D-102

9. Purpose, justification of need for, and scope of project (contd.)

A similar study was made of the R&D capital asset base at the three nuclear weapons design laboratories and NV. This study identified the plant and capital equipment (P&CE) requirements necessary to support long-term R&D objectives and requirements for environmental, safety, and health; etc. This project, 85-D-102, reflects the results of that study and includes the remainder of the test revitalization program initiated in FY 1984 as Project 84-D-107.

The consolidation of the nuclear weapons RD&T revitalization needs into one project data sheet focuses the issue of the total needs of the RD&T program and is illustrative of the interdependence of the R&D and test programs to: (1) develop and apply nuclear weapons technology to maintain and improve current weapon systems, and (2) develop new weapons for the nuclear weapons stockpile in accordance with national security requirements.

10. Details of cost estimates a/

	Total cost
a. Engineering, design, and inspection	$152,300
b. Construction costs	
(1) Improvements to land	
(2) Buildings and building modifications	
(3) Special facilities	
(4) Utilities	
c. Standard equipment	
d. Removal cost less salvage	
e. Contingency	
Total estimated cost	$152,300

The estimates by location are as follows:

Nevada Test Site and North Las Vegas ATLAS Facility, Nevada	$ 51,500
Lawrence Livermore National Laboratory, California	50,050
Los Alamos National Laboratory, New Mexico	7,900
Sandia National Laboratories, New Mexico and California	42,850
Total	$152,300

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a/ Based upon completed conceptual design reports.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations

2. Project No.: 85-D-102

11. Method of performance

Design and procurement of the conventional facilities will be performed under negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$ 54,120	$51,700	$36,800	$ 9,680	$152,300
Total facility costs	54,120	51,700	36,800	9,680	152,300
2. Other project funding					
(a) Conceptual design costs	725	0	0	0	725
Total other project funding	725	0	0	0	725
Total project funding (items 1 & 2)	$ 54,845	$51,700	$36,800	$ 9,680	$153,025

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design costs

Conceptual design cost of $725,000 was necessary to develop a budget quality cost estimate and construction schedule.

(b) Other related funding requirements

The estimated programmatic life of these facilities varies by site and subproject.

The other related funding requirements for these facilities are not considered to be significantly different from those of the facilities and equipment being replaced by this project. Therefore, no costs are shown.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California	2. Project No.: 85-D-103
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: $36,300 Date: 1/85
3a. Date physical construction starts: 1st Qtr. FY 1986	6. Current cost estimate: $41,100 Date: 1/86
4. Date construction ends: 4th Qtr. FY 1989	

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 4,700	$ 4,700	$ 4,700	$ 2,528
1986	16,400	16,400	16,400	17,172
1986 Sequestered	(0)	(400)	(400)	(0)
1987	6,900	6,900	6,900	7,800
1988	13,100	13,500	13,500	8,800
1989	0	0	0	4,800

8. Brief physical description of project

This project provides for safeguards and security (S&S) enhancement of the Lawrence Livermore National Laboratory (LLNL) and the Sandia National Laboratories, Livermore, (SNLL) sites. This project covers three principal areas of construction and equipment: (1) the LLNL site, (2) the LLNL Site 300, and (3) the SNLL site. Facilities and equipment enhancements will be directed toward increasing features to delay intruders; improved intrusion detections, alarms, and access controls; upgraded communications/assessment capabilities; and improved special nuclear materials (SNM) accountability and control.

Physical security improvements will include replacement of outmoded alarm systems, additions to or upgrading of existing alarm systems, and new systems to enhance reporting and assessment of intrusion alarms. Closed circuit television (CCTV) surveillance systems and new fences will be installed consistent with the buffer land acquisition security plan.

The projects also provide for: (1) the construction of new hardened security and communication buildings, (2) the upgrading of security communication systems, and (3) improvements to the SNM accountability and control system.

The following briefly identifies the S&S enhancements to be initiated at the LLNL, LLNL Site 300, and SNLL sites.

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California	2. Project No.: 85-D-103

8. Brief physical description of project (contd.)

a. LLNL, Livermore site

(1) Buffer zone security provisions

This work consists of fencing the new north and west buffer zone and the onsite east buffer zone; providing vehicle access and maintenance roads; and surveillance CCTV monitors with pan, tilt, and zoom capabilities.

(2) Security communications and control center addition

Construct a 3,700-square-foot addition to the basement communications area in the security building at Livermore. This project will house the controlled access by individual number (CAIN) computer and the secure interactive Livermore Alarm System (SILAS) computer, provide space for the emergency generators and uninterrupted power service in a hardened facility, and allow the communications console to expand and incorporate the new alarm and monitoring hardware.

(3) Controlled Access by Individual Number (CAIN) - Phase II

The new CAIN system will be developed to handle an enrollment capacity of 12,000 individuals, expandable to 18,000. Initially, the system will include 90 access booths which can be expanded to 500 access control points. A dual computer will be provided with applicable supplier-developed software where possible. Included in the system are dual central processing units (CPU) providing 100 percent backup, intermediate controllers serving as a buffer for information exchange between individual access points and the CPU, a television (TV) assessment subsystem to help resolve anomalies, and data link cryptographic protection. A gate logging and access control capability will be part of the CAIN system.

(4) Secure Interactive Livermore Alarm System (SILAS)

SILAS will provide an upgraded and expanded detection/alarm system of 280 channels expandable to 1,000 channels with interactive capabilities for classified and SNM areas. The system will include a computer, improved transmitter, receiver, and computer interface hardware, a TV assessment capability, and a geographic mapping alarm display.

(5) Integrated Security Control Consoles

This project will upgrade the present control and dispatch center by integrating security functions into a number of identical, graphics-oriented, processor-based control consoles. Each console will be capable of interacting with

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

8. Brief physical description of project (contd.)

CAIN, SILAS, radio dispatch, TV assessment and surveillance, and other security systems. Two operating consoles (plus one standby) will be provided for the security control building.

(6) Upgrade security radio communications system

The following security radio backup facilities will be provided:

- VHF and UHF tone control base stations
- A microwave relay station between Livermore and Site 300.

These items include associated radio towers, antennas, cables, hardware, remote control units, battery powered backup units, cabling, power, and site work. Personal secure radio (hand-held) and associated base station units are also included in this category.

(7) Improve SNM accountability and control

Additional analytical equipment for the materials management group must be purchased to provide improved nondestructive evaluation. This includes a high level neutron coincidence detector and well counter and a new computer system.

b. LLNL, Site 300

(1) New security communications and control center, Site 300

Construct a new 11,500-square-foot security communications and control center at Site 300. The hardened basement (5,140 square feet) will include the alarm console, the emergency operations center, a communications equipment room, three offices, and the armory. Existing alarm and communication cable will be rerouted and reconnected. The first floor will house the squad room, exercise/training room, shift preparation room, conference room, toilets, locker and shower rooms, garage for emergency vehicles, electronic technician's shop, vending and kitchen, and three offices. Redundant units shall serve the alarm system such that no single failure will shut down the system.

(2) Secure Interactive Livermore Alarm System

This will provide an upgraded and expanded detection/alarm system of 100 channels expandable to 200 channels with interactive capabilities for Site 300 classified and SNM areas. The system will include a computer, improved

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

8. Brief physical description of project (contd.)

transmitter, receiver, and computer interface hardware, and a geographic mapping alarm display. Two separate signals shall be sent from all critical alarms to the alarm console in the new security communication and control center.

(3) Integrated Security Control Console

This project will upgrade the present control and dispatch center by the addition of two computer-based, control consoles that will integrate the Site 300 Security functions including SILAS, TV Motion Detection and Surveillance, and radio dispatch. The consoles will be graphics-oriented and similar to the consoles at the Livermore site.

(4) Upgrade security radio communications system

The following security radio backup facilities will be provided:

- VHF and UHF tone control base stations.

These items include associated radio towers, antennas, cables, hardware, remote control units, battery powered backup units, cabling, power, a 150-square-foot building, and site work. Personal secure radio (hand-held) and associated base station units are also included at Site 300 in this category.

c. SNL, Livermore Site

(1) Perimeter intrusion alarm system

The buffer zone land to be acquired under a separate line item will be fenced at the perimeter and also at 500 feet (minimum) into the site to create a secure zone. Security access roads will be constructed in the buffer land around the perimeter of the site. To detect when perimeter security buffer zones have been penetrated, a CCTV motion detection system will be installed, along with redundant fence protection and ultrasonic and cable sensors. The CCTV motion detection system will also provide a constant surveillance of the buffer zone.

(2) New security operations and communications building

This portion of the project will afford a 9,400-square-foot security operations and communications building. The basement will be hardened and house the communications and control center and related operations for the new security system. A squad room, exercise/training room, shift preparation room, lockers, and showers will occupy the ground level.

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California
2. Project No.: 85-D-103

8. Brief physical description of project (contd.)

(3) Upgrade security radio communication system

To protect internal security communications, the radio base stations, transceivers, towers, antennas, and other associated equipment will be expanded. Existing emergency external capabilities with LLNL and local law enforcement agencies will also be strengthened.

The total estimated cost (TEC) for this project has increase $4,800,000, from $36,300,000 to $41,100,000, due entirely to the LLNL portion of the project increasing from $31,800,000 to $36,600,000. The LLNL increase is the result of escalation adjustments due to reduced FY 1986 funding, reestimating the project costs, identification of required additional TV assessment capability for the secure alarm system and the integrated security control system, identification of required additional capacity for perimeter gate logging and control for the CAIN system, and a change in construction strategy for the Livermore site security communications and control center addition. Minor reductions of work and associated costs to be performed in the buffer zone have also been included in the current TEC.

The FY 1987 funding will be used to complete engineering and design for the LLNL SILAS and CAIN subprojects, complete construction and/or procurements on the control center facilities, SNM accountability, and communications subprojects.

9. Purpose, justification of need for, and scope of project

An effective S&S system is an aggregation of the protective mechanisms which contribute to the reduction of risks from the actions of an adversary. The threat spectrum considered for this project ranges from political demonstrators, who are relatively peaceful but may intrude into the laboratories to gain media attention and cause disruption, to antinuclear extremists and terrorists who intend to sabotage facilities and/or engage in the theft of SNM. The threats posed by disgruntled employees, who may act alone or in collusion with other employees, and/or external adversaries for the purpose of espionage or sabotage have also been factored into the scope of this project.

An assessment of the risks posed by this range of threats indicates the need for substantial improvements in the LLNL and SNLL physical protection systems. Existing safeguard alarms, detection assessment systems, and signal linkages are technically obsolete and need upgrading and/or replacement. These systems have grown to the point where they have reached capacity and utilized all available space in security facilities at SNLL, LLNL, and Site 300. Further, central equipment and consoles must be housed in a hardened facility to protect the heart of the security systems.

Differences in site-specific geographical characteristics of the LLNL and SNLL sites and the LLNL explosives testing site (Site-300) require differing approaches to improving the protection system. The needs for upgrading the elements of the S&S system for all three sites are described and justified in the following sections. The protection system elements that

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California — 2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

must be addressed include deterrent and delay measures; detection, alarms, and access controls; communications and assessment capabilities; and SNM accountability and controls.

a. LLNL, Site

(1) Buffer zone security provisions

The buffer land acquisition, various locations, project (83-D-199) was funded by Congress in FY 1984 with an initial appropriation of $7,000,000. House Report 98-124 stated that the acquisition of relatively small, strategically located parcels of land adjacent to certain weapons facilities would improve physical security and prevent potential damage or sabotage of buildings and equipment. Compared to the possible damages, this program is highly cost effective. Congress appropriated an additional $17,000,000 in FY 1985 for the buffer land acquisition project.

In support of the buffer land acquisition project and to provide an effective and visible deterrent and delay barrier to a potential intruder, the buffer zone must be provided with security measures such as fences, lighting, perimeter road, and CCTV surveillance system incorporating motion detection. These improvements are necessary to reduce the frequency of adversary actions through visible deterrence and, if such actions were attempted, reduce the probability by timely interdiction/interruption.

(2) Security communications and control center addition

The existing hardened basement of the security building must be expanded to provide space for the new CAIN and SILAS computer hardware, the new integrated consoles, and additional CCTV channels. The expansion will relieve overcrowded operating conditions, allow greater ease of equipment maintenance, and improve the equipment layout to reduce the high noise level now existing in the console operator/dispatcher area.

(3) Controlled Access by Individual Number (CAIN)

Personnel access control, a key factor in an effective S&S program, is normally a function of the guard force or electronic identification or a combination of these. The proposed upgrade and expansion of the 10-year-old (CAIN) system will provide LLNL with the ability to insure more reliable access control for authorized personnel to protected and material use areas containing SNM and/or classified information and minimize inconvenience and delay to LLNL personnel. It will also maximize the cost-effective use of protective service personnel by using a computer access system rather than manpower.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

This upgraded CAIN system (Phase II) includes a new distributed computing system. It will provide an extremely reliable central system that will handle access authority files and recordkeeping. The central system will also oversee the security audit, assuring that users do not engage in improper transactions. Local microprocessors will handle the actual entry point security and aperture management details. Standard equipment will be used where possible to keep future support costs down. No known alternate technology is available which is capable of providing the necessary security, speed of operation, reliability, ease of management, and cost effectiveness of computer-based access control.

(4) Secure Interactive Livermore Alarm System (SILAS)

An upgraded and expanded detection/alarm system with interactive capability will provide LLNL's security department with a reliable system that allows immediate notification and coordinated control of all perimeter surveillance alarms and alarmed facilities in which classified parts, information, and SNM are stored. The proposed system will provide an enhanced identification system and increased computer capabilities.

Setting alarms in the "secure" or "access" mode in SNM areas and other storage facilities containing classified parts and/or material is presently a cumbersome, time-consuming, manual system. The proposed state-of-the-art system would provide new and significantly improved identification/control and reliability in the security network.

(5) Integrated Security Control Consoles

The purpose of this upgrade is to integrate the normal command and control functions of the LLNL security department into a single, efficient control mechanism. The new security consoles are intended to increase the reliability of the present hardware, expand the operators' ability to handle multiple tasks through computer graphics, shorten the response time required to assess and respond to anomalies through information processing by computer, efficiently interact with SILAS and CAIN II, and establish an effectual working environment for the operators.

(6) Upgrade security radio communications system

Security backup radio stations with associated towers and antennas are required at Livermore and a relay station between Livermore site and Site 300 to assure the availability of radio communications for the security department in emergency situations. Also, to reduce vulnerabilities, cables from the security control centers to the towers and equipment must be buried. Furthermore, hand-held secure radio units are necessary to provide prompt, secure communications between tactical security forces and the command/control center.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

(7) Improve SNM accountability & control

On a continuous basis, the ability to determine accurately quantitatively and qualitatively SNM being received and shipped or internally transferred between material balance areas is often critical to resolving differences and assuring reliable inventory records. Additional measurement equipment is needed to upgrade LLNL's nondestructive analytical capability and a new computer to handle reports and track materials.

The existing computer now used by the accountability group is seven years old, is reaching obsolescence, and has a marginal capacity to handle adequately all existing accountability and material control activities.

b. LLNL, Site 300

(1) New security communications and control center, Site 300

The present security building at Site 300 is an old, lightweight structure in a vulnerable location near a public road. A new hardened security communications and control center is required for Site 300 to protect security's central communication and alarm system, provide for expansion as increased facility surveillance and alarms are added to this system, provide an adequate emergency operations center, and assure the protection of the security force. The new building will be sited away from the public road, reducing its vulnerability to adversary action. This building will also provide training facilities, an armory, and a secure garage for the armored patrol vehicles.

(2) Secure Interactive Livermore Alarm System (SILAS)

As is true at the Livermore site, an upgraded and expanded detection/alarm system with interactive capability is necessary to provide the Site 300 security department with a reliable system that allows immediate notification and coordinated control of all alarmed facilities in which classified parts, information, and SNM are stored. The proposed system will provide an enhanced identification system and new computer capabilities.

(3) Integrated Security Control Consoles

Two upgraded consoles will each integrate SILAS, TV motion detection, and radio dispatch into a computer-based control system. The consoles will be housed in the new Site 300 Communications and Control Centers and will provide a more effective and rapid response to emergencies and minimize future manpower requirements by providing operators with processor-based assessment capabilities and information.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

(4) Upgrade security radio communications system

Security backup radio stations with associated towers and antennas are required at Site 300, as at the Livermore site, to assure the availability of radio communications for the security department in emergency situations. Hand-held secure radio units are also necessary to provide prompt secure communications between tactical security forces and the command/control center.

c. SNLL Site

(1) Perimeter intrusion alarm system

Acquisition of buffer zone property necessitates that additional intrusion alarm systems and security fencing be acquired to provide early detection and assessment of intruders. The perimeter security road would aid in both the patrol of the new buffer zone and apprehension of any intruders.

(2) Security operations and communications building

A new hardened security operations and communications building is required to protect security's central communication and alarm system nerve center. Recent vulnerability analyses and security surveys have emphasized the need to relocate critical security activities internal to the site, thus reducing their vulnerability. This building will also provide appropriate facilities for centralizing all guard force and physical security related activities as well as an emergency operations center.

(3) Upgrade security radio communication system

Upgrading of the radio communication system is required to provide communications secure from news reporters and others who continually monitor SNLL frequencies to gain information on patrol activity, emergencies in progress, routine communication which may divulge information to an adversary--such as arrival or departure of safe secure trailers, etc. The upgraded system will provide secure communication with LLNL and law enforcement agencies and will provide an increased level of duress reporting. SNLL began a minimal conversion to a secure radio system with digital voice protection in FY 1982-FY 1983 with the acquisition of a base station and five portable transceivers.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements, LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

10. Details of cost estimates a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 15 percent of construction costs, item b		$ 3,450
b. Construction costs		23,420
(1) Improvements to land, including grading, paving, parking, fencing, and walks	$ 2,290	
(2) Security communications/control center - Site 300	1,700	
(3) Security communications/control center addition - Livermore site	805	
(4) Security communications/operations building - Sandia site	1,660	
(5) Utilities-mechanical, water, electrical power, communications, sewer, & area lighting	3,735	
(6) Special facilities including CAIN access control systems, interactive alarm system radio base stations	13,230	
c. Standard equipment includes SILAS and CAIN computer hardware, secure personal radios, surveillance TVs, accountability/material control computer		8,875
d. Removal cost, less salvage		25
Subtotal		35,770
e. Contingency at approximately 15 percent of above costs		5,330
Total estimated cost		$41,100

The estimates by location are as follows:

Lawrence Livermore National Laboratory, Livermore, California	$36,600
Sandia National Laboratories, Livermore, California	4,500
Total	$41,100

11. Method of performance

Design will be on the basis of a negotiated architect-engineer contract. Minor work and equipment procurement will be performed by LLNL and SNLL. To the extent feasible, construction and procurement will be accomplished by fixed-price contract awarded on the basis of competitive bidding.

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a/ Estimate based upon a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$19,700	$ 7,800	$ 8,800	$ 4,800	$41,100
Total facility costs	19,700	7,800	8,800	4,800	41,100
2. Other project funding					
(a) Conceptual design costs	150	0	0	0	150
Total other project costs	150	0	0	0	150
Total project costs (items 1 and 2)	$19,850	$ 7,800	$ 8,800	$ 4,800	$41,250

b. Other related funding requirements (estimated life of project: 30 years)

1. Facility operating costs	$ 255
2. GPP or other construction related to programmatic effort in the facility	60
Total other related annual funding requirements	$ 315

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
1. Other project costs

(a) Conceptual design costs
Approximately $150,000 was required to prepare a conceptual design, preliminary schedule, and cost estimate for this project.

b. Other related funding requirements
1. Facility operating costs

Facility operating costs of $255,000 are projected to cover the costs of maintenance and utilities for the project.

2. GPP or other construction related to programmatic effort in the facility

Initially, no GPP costs are anticipated but, to keep abreast of technology, presently undefined alterations estimated at $60,000, will likely be required in the future.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Hardened engineering test building, Lawrence Livermore National Laboratory (LLNL), Livermore, California

2. Project No.: 85-D-106

3. Date A-E work initiated: 2nd Qtr. FY 1985

3a. Date physical construction starts: 1st Qtr. FY 1986

4. Date construction ends: 2nd Qtr. FY 1987

5. Previous cost estimate: $2,700
Date: 1/85

6. Current cost estimate: $3,130
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 800	$ 800	$ 800	$ 270
1986	1,900	1,900	1,900	2,330
1986 Sequestered	(0)	(100)	(100)	(0)
1987	430	430	430	430
1988	0	100	100	100

8. Brief physical description of project

This project will provide a hardened, reinforced concrete test facility consisting of a single-story element with two 31-foot-high test bays, a control room, an office/conference room, and support space comprising of approximately 6,300 square feet. In addition, there are two 1,800-square-foot areas over a portion of the single-story element which will provide the space for the intrinsic radiation control room, the mechanical and electrical equipment, air filter system, and other service requirements. This facility will also have a detection system compatible with the site's security system.

One test bay will house the intrinsic radiation (INRAD) activity presently conducted in an existing high bay building; the other will house engineering test equipment such as shakers, hyges, thermal chambers, and impact testers. Each bay will be equipped with a 5-ton crane, high efficiency particulate air (HEPA) filter system, and LN_2 system. The building will be a hardened facility with vault or severe service doors, appropriate alarms, and located within an exclusion area.

Existing mechanical utilities will be relocated to clear the site and service the building along with nearby electrical and communication utilities. An automatic fire sprinkler system will be installed and normal building heating and cooling systems, with due regard to energy conservation, will be provided. Minimal land improvements will include service yard paving and fencing.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened engineering test building, Lawrence Livermore National Laboratory (LLNL), Livermore, California

2. Project No.: 85-D-106

8. Brief physical description of project (contd.)

Safeguards and security considerations have placed a requirement to accommodate a rooftop hardened guard post with this facility. Structural and utility interfaces are included in this project while the actual guard post and installation will be provided for in a safeguards and security line item project.

The total estimated cost of the project has increased $430,000, from $2,700,000 to $3,130,000, as a result of reestimating the project and the addition of safeguards and security features into the project which are integral to the master plan of the exclusion area.

The FY 1987 funding will fully fund and permit completion of the project.

9. Purpose, justification of need for, and scope of project

Safeguards and security vulnerability reviews have resulted in the way INRAD measurements and engineering tests of special nuclear materials nuclear explosive-like assemblies (SNM NELA's) will be conducted at LLNL. As a result of safeguards and security concerns, a decision has been made to reduce the number of SNM NELA engineering tests at Site 300 to a minimum and to move the INRAD facility out of the currently occupied high bay building.

The reduction in effort at Site 300 is due to vulnerability reviews and the ability to defend SNM there. Rather than incur large costs for hardening facilities and staffing the security force, most SNM NELA engineering tests will, in the future, be conducted at the Livermore site. No existing building meets the requirements for space and security; therefore, a new structure is needed for engineering tests. SNM NELA engineering tests at Site 300 will be kept to a minimum until a new building is available at the Livermore site.

The INRAD facility also must be relocated for similar security reasons. The current location is unacceptable, both for softness of the structure and for its proximity to the perimeter fence.

The new facility will be located adjacent to plutonium and tritium facilities and within their exclusion area. This area is being upgraded to a protected area for SNM. This facility will include protective mechanisms including an exterior surveillance system to reduce the threat of adversary actions aimed at espionage, sabotage, or theft of SNM. Continuance of both the SNM NELA engineering tests and the INRAD activity is a programmatic necessity. A new hardened facility which meets safeguards and security requirements is urgently needed.

This building occupies an optimum location for a hardened guard post. Integrating structural and utility provisions with this project minimizes total eventual costs, avoids extensive rework, and minimizes vulnerability of the subject hardened guard

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened engineering test building, Lawrence Livermore National Laboratory (LLNL), Livermore, California

2. Project No.: 85-D-106

9. Purpose, justification of need for, and scope of project (contd.)

post. The additional expense to this project is further justified since this facility shares safeguards and security interests with other programs function within the secure island.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 21 percent of construction costs, item b		$ 430
(1) Titles I & II	$ 280	
(2) Title III	150	
b. Construction costs		2,280
(1) Improvements to land, including grading, paving, walks, and landscaping	40	
(2) Building - approximately 9,900 square feet at about $195 per square foot	1,930	
(3) Special facilities - safeguards equipment	70	
(4) Utilities, including mechanical utilities, sanitary and storm sewers, electrical power, communications, and area lighting	240	
c. Relocate existing equipment		80
Subtotal		$2,790
d. Contingency at approximately 12 percent of above costs		340
Total estimated cost		$3,130

11. Method of performance

Design will be accomplished on the basis of a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bidding. Minor architect-engineer work, site preparation, and activation will be performed by LLNL.

12. Funding schedule of project funding and other related funding requirements

Not applicable.

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened engineering test building,
Lawrence Livermore National Laboratory (LLNL),
Livermore, California

2. Project No.: 85-D-106

13. Narrative explanation of total project funding and related funding requirements

Not applicable.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Radiation-hardened integrated circuit laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico

2. Project No.: 84-D-102

3. Date A-E work initiated: 2nd Qtr. FY 1984

3a. Date physical construction starts: 2nd Qtr. FY 1985

4. Date construction ends: 2nd Qtr. FY 1987

5. Previous Cost Estimate: $40,500
Date: 1/85

6. Current cost estimate: $40,500
Date: 9/85

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	$ 2,000	$ 2,000	$ 2,000	$ 869
1985	20,000	20,000	20,000	1,178
1986	15,500	15,500	15,500	21,753
1987	3,000	3,000	3,000	16,700

8. Brief physical description of project

This project provides for the construction of a two-story laboratory building of approximately 174,000 square feet including a water chiller plant of about 6,000 square feet. The laboratory building will have approximately 38,000 square feet of heavy laboratory of which approximately 12,000 square feet will be a completely flexible class 10 at 0.10 microns clean room area. Within this class 10 clean room, local regions will be operated at class 1 cleanliness level. In these regions, vibration must be minimized, and both temperature and humidity will be precisely controlled (± 1/2° fahrenheit, ± 2.5 percent relative humidity). The heavy laboratory utilities area (72,000 square feet) will primarily be equipment rooms containing the clean room's specialized heating, ventilating, air-conditioning, and utilities requirements; the balance of the building, about 63,000 square feet, will be light laboratory offices, restrooms, and corridors to support the Sandia radiation-hardened integrated circuit laboratory.

The FY 1987 funding requested provides for the completion of the project and will fully fund the project.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Radiation-hardened integrated circuit laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico

2. Project No.: 84-D-102

9. Purpose, justification of need for, and scope of project

In 1974, SNL and the Department of Energy (DOE) decided to build the present radiation-hardened integrated circuit laboratory by modifying and adding on to existing buildings, both to develop new radiation-hardened integrated circuit designs and technology and to provide a backup production source in the event the American semiconductor industry could not satisfy DOE production needs.

This facility has been very successful in allowing Sandia systems to utilize the latest large-scale integrated (LSI) circuits in weapon systems designs. The W78, W81, W82, B83, W84, and B61-7 all utilize integrated circuits (IC's) which are designed and produced by the Sandia radiation-hardened integrated circuit laboratory. Although industry is supplying almost all of the large-scale integrated circuit needs on these programs, there are specific cases where the Sandia facility is either the sole source or the planned source for a very small, critical fraction of the production because American industry cannot or will not produce these complex, radiation-hardened parts. Work continues to transfer production to industry where possible, but it is recognized that in-house production is essential to allow weapon systems to make effective use of large-scale integrated circuits.

The component deliveries from the Sandia facility have increased rapidly. In 1980, only a few hundred units were supplied to the production plant in Kansas City, Missouri. In 1981, approximately 5,000 good chips and packaged IC's were provided to the Kansas City Plant. The 1982 orders exceeded 60,000 units. The present LSI clean room facility will be required to support DOE large-scale integrated circuit production requirements for the next decade, and the responsibility for the production of current weapon IC's is in the second of a three-year program to transfer it to the Bendix Corporation.

The present facility at SNL is adequate to meet these production needs for the next five years. Where inadequacies surface, they can be addressed by modifying or supplementing present facilities. However, the next generation very large-scale integrated (VLSI) technologies, which will be required by Sandia systems, place environmental demands on the present facility that cannot be met. It is clear that VLSI technology, if available with adequate reliability and radiation-hardness, offers one key to improve weapon performance, command and control, and safety and security through increased weapon "intelligence."

The proposed radiation-hardened integrated circuit laboratory is an R&D facility, not designed for production, and it provides for a very large-scale integrated circuit quality clean room to match the requirements of the 1990's technologies we will be needing. In this facility, the vibration level, air and water cleanliness, humidity, and temperature must be controlled to a greater degree than is possible in the present facility.

Success in very large-scale integrated circuits also requires a greater degree of interaction between designer, technologist, and fabricator than required by present large-scale integrated circuits, since very-large scale integrated circuits work closer to basic material and device limits. Thus, the new building has been designed to pull together much of the very large-scale integrated circuit staff into a single building.

1. Title and location of project: Radiation-hardened integrated circuit laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico

2. Project No.: 84-D-102

9. Purpose, justification of need for, and scope of project (contd.)

Without this new facility, it will be virtually impossible for DOE to develop and utilize radiation-hardened VLSI in systems of the 1990's.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at about 11 percent of construction costs, item b		$ 2,500
b. Construction costs		24,500
(1) Improvements to land, including grading, excavations, landscaping, paving, and roads	$ 400	
(2) Building - approximately 174,000 square feet at about $121 per square foot	21,100	
(3) Utilities	3,000	
c. Standard equipment		11,500
(1) New equipment (lithography, etching, implantation, etc.)	8,000	
(2) Relocate existing equipment	3,350	
(3) Emergency generator	150	
Subtotal		38,500
d. Contingency at approximately 5 percent of above costs		2,000
Total estimated cost		$40,500

11. Method of performance

Building design and inspection will be performed under a negotiated architect-engineer contract. Equipment design will be performed by SNL personnel. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

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a/ Based upon Title II design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Radiation-hardened integrated circuit laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico

2. Project No.: 84-D-102

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	Total
a. Total project funding			
1. Total facility costs			
(a) Construction line item	$23,800	$16,700	$40,500
Total facility costs	23,800	$16,700	$40,500
2. Other project funding			
(a) Conceptual design costs	30	0	30
Total other project funding	$ 30	$ 0	$ 30
Total project funding (items 1 and 2)	$23,830	$16,700	$40,530

b. Other related funding requirements (estimated life of project: 50 years)

1. Facility operating costs	$ 500
2. Programmatic operating expenses directly related to the facility	25,000
Total other related annual funding requirements	$25,500

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
  1. Other project funding
    (a) Conceptual design costs

A conceptual design was prepared for this project at a cost of $30,000.

b. Other related funding requirements
  1. Facility operating costs

Costs of unrecoverable materials and expenses used during operating and maintenance activities. Includes chemicals, gases, lubricants, waste disposal, and maintenance of steam and condensate lines.

  2. Programmatic operating expenses directly related to the facility

The operation and maintenance staff requirements include approximately 250 persons at $100,000 per year per person.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Simulation technology laboratory, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

3. Date A-E work initiated: 4th Qtr. FY 1982

3a. Date physical construction starts: 4th Qtr. FY 1983

4. Date construction ends: 4th Qtr. FY 1986

5. Previous cost estimate: $40,000
Date: 1/85

6. Current cost estimate: $40,000
Date: 9/85

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1982	$ 1,200	$ 1,200	$ 1,200	$ 33
1983	3,000 a/	3,000 a/	2,998 a/	1,156
1984	8,000	8,000	8,002	3,473
1985	11,500	11,500	11,500	5,138
1986	10,300	10,300	10,300	13,800
1987	6,000	6,000	6,000	10,500
1988	0	0	0	5,900

8. Brief physical description of project

This project provides for the construction of one accelerator, Hermes III; the modification of an existing accelerator, Particle Beam Fusion Accelerator-I (PBFA-I); the necessary laboratory space for housing the Hermes III accelerator and other existing accelerators to be moved to the Simulation Technology Laboratory (STL); a control room; and the supporting diagnostics and data acquisition systems. Also included is laboratory space for experiments associated with utilization of the accelerators. The laboratory building consists of approximately 54,900 square feet--42,200 square feet of high bay/low-bay laboratory, and 12,700 square feet of light laboratory/office space. Utilities, including water, sewer, underground power, and natural gas, will be extended from existing nearby utility systems.

The building will be constructed of prestressed, precast concrete wall and roof panels with integral wall insulation. Portions of the building below grade will be cast-in-place concrete. Special systems for storage, transfer, and processing of deionized water and transformer oil will be provided.

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a/ Based on Continuing Resolution, Public Law 97-377.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

8. Brief physical description of project (contd.)

Hermes III will be an advanced gamma-ray simulator which will run at higher voltages, higher currents, and shorter pulses than the existing Hermes II accelerator. A factor of 10 in increased performance, coupled with increased exposure area, will allow testing of subsystems and systems which cannot be tested at Hermes II. The modified PBFA-I accelerator will be an advanced x-ray simulator which will provide higher fluences for larger area exposures and improved spectrum compared to existing x-ray sources such as Rehyd, Hydra, and Proto II. The modified PBFA-I will allow x-ray testing that is currently needed, but not now possible.

The FY 1987 funding will fully fund the project and allow its completion.

9. Purpose, justification of need for, and scope of project

In order to develop simulation testing capabilities and apply them to the conduct of weapon effects tests on a timely basis, facilities dedicated to such uses are required. The simulation sources to be associated with the STL will be major improvements over the gamma-ray and x-ray laboratory sources that are presently available. They will, in many instances, have capabilities which match or are superior to the capabilities of underground testing. For example, the new radiation sources in STL will possess a better match to vulnerability requirements of dose, dose rate, pulse width, and spectral character than is presently available. Exposure areas available for testing will satisfy most agency requirements. In addition to weapons effects testing, the simulation sources will be available for use in future weapon system development and stockpile evaluation programs.

Justification for the STL rests on the fact that future United States nuclear weapon systems such as the PEACEKEEPER and TRIDENT II will require new laboratory radiation facilities for vulnerability, hardening, and survivability testing. Existing laboratory simulation facilities simply cannot provide the necessary output levels over adequate exposure areas and volumes. Furthermore, existing facilities cannot address vulnerability problems associated with potential new defensive weapons such as directed energy devices. In the event of a comprehensive test ban treaty (CTB), these sources would be vital to the maintenance of a viable weapon system development program and the associated strong defense posture.

Directed energy weapons, using particle beams or lasers, offer great promise. High-intensity particle beams and radiation fields are central to these schemes. STL facilities will offer means for studying the propagation of high-intensity particle beams and the physics of x-ray lasing. The energy densities needed for such studies are now available only in underground nuclear tests. Experimental study of the physics of these phenomena, to the extent possible in STL, would be less expensive and more efficient than through underground nuclear tests.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

9. Purpose, justification of need for, and scope of project (contd.)

A dedicated simulation facility with vastly improved capabilities is possible because of recent advances in Sandia's Pulsed Power Program and increased understanding of electron beam transport physics. The STL would contain Hermes III, an advanced gamma-ray simulator. Hermes III is projected to be capable of delivering up to 0.6 million joules of e-beam energy in a single pulse to a bremsstrahlung converter target. A modified PBFA-I will be capable of delivering up to 0.5 million joules of energy to x-ray producing targets in a single pulse.

If STL were not constructed, essential radiation effects testing activities associated with development and hardness assurance of future weapon systems would be impacted. Existing sources such as Hermes II would have to continue to be utilized for testing. This source is more than 10 years old, is experiencing serious operational problems because of age, and should be replaced. While the existing simulation sources have made significant contributions to the development of many United States weapon systems, they have not adequately matched important threat environmental characteristics that generate dose-rate-dependent radiation effects. The new advances in pulse power technology will make it possible to improve substantially this match and to achieve higher exposure levels over larger areas that will be required for testing of future systems.

The increase in the total estimated cost reflects adjustments made as the result of extending the completion date and funding requirements one year.

10. Details of cost estimate

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 25 percent of construction costs		$ 6,570
b. Construction costs		24,180
(1) Improvements to land, including grading, paving, and fencing	$ 70	
(2) Building, approximately 54,900 square feet at about $155 per square foot	8,040	
(3) Special facilities, Hermes III and modifications to PBFA-I	15,350	
(4) Utilities, including mechanical utilities, sanitary and storm sewers, and electrical power	720	
c. Standard equipment (office and laboratory)		3,650
Subtotal		$34,400
d. Contingency at approximately 16 percent of above costs		5,600
Total estimated cost		$40,000

11. Method of performance

Design and inspection of the building will be on the basis of a negotiated fixed-fee contract. Construction will be by fixed-price contract awarded on the basis of competitive bids. Sandia National Laboratories will design, procure, and install the accelerator and instrumentation components.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	$23,600	$10,500	$ 5,900	$40,000
Total facility costs	23,600	10,500	5,900	40,000
2. Other project funding				
(a) Conceptual design	30	0	0	30
(b) Other project related funding	12,550	800	0	13,350
Total other project funding	12,580	800	0	13,380
Total project funding (items 1 and 2)	$36,180	$11,300	$ 5,900	$53,380

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	$ 340
2. Programmatic operating expenses directly related to the facility	6,000
3. Capital equipment not related to construction but related to the programmatic effort in the facility	500
4. GPP or other construction related to programmatic effort in the facility	450
Total other related funding requirements	$ 7,290

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding

      (a) Conceptual design was prepared by an architect-engineer firm at a cost of $30,240.

      (b) Research and development effort related to development of the accelerators at a cost of $13,350,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 20 years.

1. Facility operating costs

Utility, janitorial, and maintenance costs estimated at approximately $8 per square foot annually.

2. Programmatic operating expenses directly related to the facility

Salaries and supplies for approximately 60 people estimated at $100,000 per person, per year.

3. Capital equipment not related to construction but related to the programmatic effort in the facility

Equipment requirements estimated to maintain the annual programmatic effort. No installations of new programmatic-related capital equipment are anticipated.

4. GPP or other construction related to programmatic effort in the facility

Construction requirements estimated to maintain the annual programmatic effort.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars)

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1. Title and location of project: Combined device assembly facility, Nevada Test Site, Nevada

2. Project No.: 85-D-105

3. Date A-E work initiated: 1st Qtr. FY 1985

3a. Date physical construction starts: 3rd Qtr. FY 1986

4. Date construction ends: 1st Qtr. FY 1990

5. Previous cost estimate: $75,000
Date: 1/85

6. Current cost estimate: $69,500
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 3,000	3,000	$ 3,000	$ 2,789
1986	7,000	7,000	7,000	6,211
1987	14,000	14,000	14,000	10,200
1988	30,000	30,000	30,000	29,100
1989	15,500	15,500	15,500	20,600
1990	0	0	0	600

8. Brief physical description of project

This project will provide a new multistructure, nuclear combined device assembly facility (DAF) containing approximately 100,000 gross square feet of floor space within a 22 acre, high security exclusion area in the central portion of the Nevada Test Site (NTS). The DAF provides modern facilities for the consolidation of all Department of Energy (DOE) nuclear test device assembly functions and a capability for the disassembly of damaged or disabled nuclear weapons.

Included in the assembly/disassembly operational facilities are five containment cell (Gravel Gertie) structures, three assembly bays, one storage bay, four high bays, two radiographic facilities, four high explosive/special nuclear material (HE/SNM) storage bunkers, two HE storage magazines, one pit processing laboratory, connecting corridors, one administrative office area, mechanical/electrical support areas, and two storage buildings. All of the above structures except the main mechanical/electrical support building are surrounded or overlain by an earthen berm. All assembly/disassembly facilities will be provided with fire protection and detection systems and radiological floor drains connected to an isolated sump and decontamination system.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

8. Brief physical description of project (contd.)

Principal security features of the entire complex are two elevated hardened guard towers; a hardened guard complex; one hardened, earthen bermed primary alarm station and one hardened earthen bermed secondary alarm station; and 4,000 linear feet of 8-foot high parallel chain link, perimeter fences with associated perimeter intrusion alarms, lighting, and video assessment. Each cell, bay, bunker, or any other areas that could contain special nuclear material (SNM) will have interior security alarms, and video assessment. The entire complex will also be protected with an aircraft early detection system and a helicopter landing avoidance system.

Primary utilities include a 3,750 kVA electrical substation, one-third mile of 34.5 KV underground power transmission line, two miles of 12-inch water line with one 250,000-gallon water storage tank, and a self-supporting sewage collection and treatment system. Utilities and other support systems' capacities will be sufficient to accommodate future expansion.

Major improvements to the land are about 22 acres of site grading and drainage diversion, 119,000 square yards of paving within the complex, and one mile of 26-foot wide paved access road with 10-foot wide graded shoulders. Major standard equipment items are one linear accelerator and 23 overhead cranes.

Further descriptions of the primary buildings and structures mentioned above are as follows:

The "Gravel Gertie" assembly facilities are positioned with access to a north-south aligned interior corridor. Each Gravel Gertie includes a circular work area 34 feet in diameter with overhead bridge cranes, associated support structures including air-locked access vestibules, decontamination facilities, and mechanical and electrical support buildings. The circular assembly structures have 12-inch-thick concrete walls and a catenary roof structure overlain with 25 feet of well-graded gravel. The air-locked access vestibules will be equipped with a double set of blast doors for equipment and personnel access. Mechanical and electrical equipment will be located in the main support building and the second floor corridor.

Three assembly bays will be erected with two openings into an interior corridor and one into an exterior corridor. Each bay (30 feet by 60 feet overall with 30 feet by 28 feet working space) will have 18-inch-thick concrete walls, a 15-ton bridge crane, 20-foot-high ceilings with separate personnel and equipment access air locks, and double blast doors. The storage bay will be 30 by 30 feet, identical to a small HE/SNM bunker, with a 20 foot clear height. These facilities will be earth bermed and overlain with earth fill.

Two radiography buildings are located with access to the interior corridor. The radiography complex will include a 1,310-square-foot linear accelerator (LINAC) bay fitted with air-locked access corridors, blast doors, and supporting facilities comprised of a control room, service area, dark room, and radiography room. The LINAC bay with 24-inch-thick

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility, Nevada Test Site, Nevada

2. Project No.: 85-D-105

8. Brief physical description of project (contd.)

concrete walls will be bermed with 13 feet of sand to prevent radiation bleed-through. The walls of the supporting facilities will be 18 inches thick. The LINAC facilities will include vacuum, compressed air, and individual heating and cooling controls, and each will contain a 10-ton bridge crane.

Four 30- by 60- by 25-foot high bays to support test device assembly operations will be provided. A high bay will typically have 18-inch-thick concrete walls and blast doors opening into a 16-foot-wide by 16-foot-high corridor. One of the high bays will be equipped with a 16 by 16-square-foot roof hatch and corresponding floor pit. Explosion-proof electrical fixtures and a 15-ton bridge crane are included. Space for controls for gas pressure testing will be provided in an assembly bay.

A 60- by 30- by 12-foot high processing laboratory of reinforced concrete and bermed construction will provide space for device pit instrumentation and testing similar to device gas pressure testing. A small day vault within this laboratory will serve for temporary storage of the nuclear material components of test devices.

The proposed facility will include one 60- by 30-foot device storage bunkers, two 25- by 36-foot magazines for high-explosives, one vault for SNM, one vault for Class C explosives storage, and two decontamination/rest rooms. It will also include three 30- by 30-foot HE/SNM bunkers. The 25- by 36-foot structures will be steel arch construction. The remaining structures will be constructed with reinforced concrete walls. All structures will have bullet-resistant doors and explosion-proof electrical fixtures.

The combined administrative support offices for the device assembly function will be within a single concrete structure containing approximately 7,000 gross square feet of floor space.

All the operational structures are accessed off a connecting corridor which is rectangular in plan. The corridor is of reinforced concrete construction with two levels, each 18 feet wide. The combined length of the various corridor sections is about 1,370 feet. The one exposed corridor wall has emergency personnel doors and vehicle doors both of hardened construction. The first level is 16 feet high and provided with independent hearing, cooling, ventilation, fire suppression systems, and compressed air supplies. Compressed air conduits will include access points spaced at 50-foot intervals along the corridors to support air pallet operations. The second-level corridors will be a minimum of 12 feet high to accommodate the HVAC systems, duct work, filters, and electrical equipment.

Two reinforced concrete buildings each approximately 2,000 square feet will be erected, one at each side of the administration building. These structures will be used to receive and ship test device components.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility, Nevada Test Site, Nevada
2. Project No.: 85-D-105

8. Brief physical description of project (contd.)

A 140- by 40-foot preengineered metal mechanical/electrical support building will be constructed outside the parallel chain link fence but within a single chain link connecting fence. This building will house the central plants for heating/cooling systems and electrical switch gear.

An entry guard complex will be provided to control access to the DAF and the mechanical/electrical support building. This complex will consist of a hardened security post, a vehicle inspection area, personnel and vehicle entrapment areas, and a second security force area, a portion of which is hardened.

Security surveillance of the DAF perimeter will be sustained from two approximately 51-foot-high hardened guard towers constructed of precast concrete, double T sections. The towers will have controlled access to both levels of the corridor. The various levels will be platforms for fire control, and the top floor will consist of an observation cab. Each tower will have a break area and rest room facilities.

An approximately 1,000-square foot primary alarm station of reinforced concrete and earth berm construction with bullet-resistant access doors is included. The floor space will be divided into a control room, battery room, and rest room. A fully redundant secondary alarm station will be provided at a location within the facility.

The total estimated cost of this project has been reduced by $5,500,000, from $75,000,000 to $69,500,000, as the result of reducing the size and scope of the project by approximately 25,000 square feet, from 125,000 square feet to 100,000 square feet. These reductions are made in response to language contained in H.R. 99-235, Conference Report on the Department of Defense Authorization Act of 1986. The reduced facility still meets safety, security, and operational requirements.

The requested FY 1987 funding is required to fund initially the United States Army Corps of Engineers (USACE) fixed-price construction contract, continue the USACE construction management contract, and provide for inspection.

9. Purpose, justification of need for, and scope of project

The primary purpose of this project is to consolidate all DOE nuclear test device assembly functions at a location on the NTS which provides for deployment of optimal security measures and countermeasures and includes structures which meet current DOE safety standards for nuclear materials and high-explosives operations. In addition, this project will provide a capability for the inspection and disassembly of damaged or disabled nuclear weapons.

The above functions are necessary or are directly related to the nuclear weapons program mission. The nuclear test device assembly operations, which require mating SNM and HE materials and components to the proper configuration for testing, have been conducted at two locations on the NTS and one location at the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

9. Purpose, justification of need for, and scope of project (contd.)

The two NTS locations were the subject of a series of security evaluations. Based upon the security evaluations, measures requiring the discontinuance of assembly activities at one of the two NTS locations and the installation of interim security improvements at the other location have been completed.

A similar security evaluation was conducted at the LANL facilities in New Mexico. The subsequent inspection and evaluation (I&E) report resulted in an immediate discontinuance of all LANL nuclear test device assembly operations involving SNM and a transfer of those operations to the NTS. Prior to the I&E report, LANL recognized the safety and environmental protection inadequacies of its local assembly operations and submitted a 1985 budget request for Project 85-D-104, Test Devices Assembly Building (TDAB), which employed the Gravel Gertie concept to contain the spread of radioactive particulates in the event of an accidental HE detonation. However, because of security deficiencies at LANL, the TDAB project has been cancelled and the TDAB functional and related facilities requirements have been included in the DAF scope.

The interim security upgrades measures and facilities constructed at one of the NTS device assembly locations minimally provide the total capacity required by the Department's weapons laboratories for the conduct of nuclear device testing. It is therefore critical that the DAF be completed on schedule. In addition, the NTS assembly facilities do not meet Department safety criteria for SNM and HE rating activities.

Funds for a dedicated damaged nuclear weapons capability are included in Project 82-D-106, Weapons Assembly Facilities, Pantex Plant, Amarillo, Texas. A congressionally approved rescoping of Project 82-D-106 provided for relocating the damaged weapons disassembly function to the NTS. Based on this approved rescoping, an agreement between the Albuquerque Operations Office and the Nevada Operations Office (NV) was written which states that "A NV Facility at the Nevada Test Site will be made available to perform...operations on selected significantly damaged nuclear weapons...that are deemed inappropriate for processing at Pantex."

The new facility has been designed with security and safety as primary features. The basic features of location, terrain, and hardened construction are essential to retaining a secure posture as the threats evolve even more severe than those currently postulated. In addition, the facility will incorporate Gravel Gertie type assembly facilities to prevent dispersion of nuclear contamination into the environment, should an accidental high level explosion occur. It will also include specialized environmental controls, filtering systems, and air locks to maximize personnel safety and to prevent contamination of the environment.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

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10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at about 17 percent of construction costs, Item b		$ 8,900
(1) Title I and II	$ 6,230	
(2) Title III	2,670	
b. Construction costs		52,100
(1) Improvements to land	2,250	
(2) Buildings	35,050	
(3) Utilities	2,750	
(4) Security systems	5,700	
(5) Special equipment	3,950	
(6) Construction management	2,400	
c. Standard equipment		1,200
Subtotal		62,200
d. Contingency at approximately 12 percent of above costs		7,300
Total estimated cost		$69,500

11. Method of performance

Engineering, design, and inspection will be performed under an existing NV onsite-services cost-plus-award-fee (CPAF) architect-engineer (A-E) contract utilizing competitively selected A-E subcontractors in specialized areas. Long-lead procurements will be performed by NV and its existing CPAF operating contractor. Selected construction elements, such as primary utilities and roads extensions, will be performed by the existing NV CPAF operating contractor. The major facilities construction will be performed by a competitively selected, fixed-price, prime NV contractor. Construction management services will be provided through existing agreement with the Corps of Engineers.

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a/ Based upon approximately 25 percent completion of formal design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility, Nevada Test Site, Nevada

2. Project No.: 85-D-105

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	$ 9,000	$10,200	$29,100	$20,600	$ 600	$69,500
Total facility cost	9,000	10,200	29,100	20,600	600	69,500
2. Other project funding						
(a) Conceptual design costs	600	0	0	0	0	600
Total other project funding	600	0	0	0	0	600
Total project funding (items 1 and 2)	$ 9,600	$10,200	$29,100	$20,600	$ 600	$70,100

b. Other related funding requirements (estimated life of project: 30 years)

1. Facility operating costs	$ 6,000
2. Programmatic operating expenses directly related to the facility	3,000
3. Capital equipment not related to construction but related to the programmatic effort in the facility	200
Total other related annual funding requirements	$ 9,200

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

Conceptual design cost of $600,000 is necessary to develop a budget quality cost estimate and construction schedule.

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 30 years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility, Nevada Test Site, Nevada

2. Project No.: 85-D-105

13. Narrative explanation of total project funding and related funding requirements (contd.)

    1. Facility operating costs

       This item includes all costs associated with building occupancy such as utilities, maintenance, custodial, telephone, security, taxes, etc.

    2. Programmatic operating costs directly related to the facility

       Costs to support users in the accomplishment of the weapons test program are included in this item.

    3. Capital equipment not related to construction but related to the programmatic effort in the facility

       This item includes cost for miscellaneous initial startup laboratory and machine shop equipment.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

3. Date A-E work initiated: 1st Qtr. FY 1984

3a. Date physical construction starts: 2nd Qtr. FY 1984

4. Date construction ends: 4th Qtr. FY 1988

5. Previous cost estimate: $78,940
Date: 1/85

6. Current cost estimate: $79,240 a/
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	$13,500 b/	$29,140 b/	$29,140 b/	$ 5,096
1985	21,900	21,900	20,600	19,016
1986	14,900	12,900	14,200	24,228
1987	28,940	15,300	15,300	26,900
1988	0	0	0	4,000

8. Brief physical description of project

This project provides for the construction of new facilities; modifications, relocations, and additions to existing facilities; and new and replacement equipment for the revitalization of the nuclear weapons research, development, and testing (RD&T) facilities at the Los Alamos National Laboratory (LANL), the Lawrence Livermore National Laboratory (LLNL), the Nevada Test Site (NTS), and the North Las Vegas (NLV) ATLAS facilities. This project is a capital investment program to provide new or additional capabilities or capacities to the nuclear weapons testing complex. These new and modified facilities and equipment will replace or add to existing facilities that are overaged, deteriorated, overcrowded, or are inadequate to meet the capabilities required for the current and future weapons testing program and to achieve a long-term balanced test program and

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a/ The total estimated cost (TEC) is based on completed subproject conceptual design. This is the initial project in a multi-phased effort to revitalize the RD&T complex. The current planning estimate for the revitalization effort is $1,925,000,000. This estimate includes the $79,240,000 included in this Project 84-D-107.

b/ Includes $5,640,000 reprogrammed from FY 1984 weapons activities operating expenses.

8. Brief physical description of project (contd.)

analysis of the materials and data obtained from such a test program. In addition to providing facilities and equipment in direct support of the testing program, this project also provides for necessary upgrades for environmental, safety, and health requirements.

The following briefly describes the purpose and justification for the subprojects to be funded in this project.

Nevada Test Site (NTS) and North Las Vegas (NLV) ATLAS Facility, Nevada

a. Field Engineering Complex, NLV, Nevada
(TEC $27,000,000; FY 1984 funding $1,300,000; FY 1985 funding $2,000,000; FY 1986 funding $8,400,000; FY 1987 funding $15,300,000)

This project, as currently proposed, will provide for the acquisition of site property, the construction of a new 96,000 square foot building, and the acquisition of an existing building, approximately 152,000 square feet, and its contiguous property. The proposed site property to be acquired for the new 96,000 square foot building will consist of an undeveloped 38.3 acre site adjoining the existing NLV complex. This tract of land will: (1) accommodate a major 96,000 square foot construction project for expansion of the field engineering complex in NLV; (2) provide contiguous undeveloped land which will provide the opportunity for effective utilization and orderly facilities development relating to other weapons program projects; and (3) provide improved physical security arrangements. In addition to the construction of the new 96,000 square foot building and a vehicle parking area, it has been recommended by the Corps of Engineers in a report dated November 1983 that the Department of Energy (DOE) purchase in its entirety a second building, the existing leased building of 152,380 square feet adjacently located to the NLV complex with paved parking on a 19.8 acre tract. The combined space utilization from these two buildings will meet the requirements of the weapons test program in the most economical fashion.

The total estimated cost of this subproject has increased by $300,000, from $26,700,000 to $27,000,000, due to the addition of the Army Corps of Engineers as construction manager to the project team and escalation adjustments due to reduced FY 1986 funding.

The need for these two facilities primarily results from the expanded programmatic support needs of LANL, LLNL, and Sandia National Laboratories (SNL). The facilities will permit consolidation of the following contractor (EG&G) functions: LLNL Engineering and Prestaging; LANL Engineering and Prestaging; SNL and Department of Defense (DOD) Engineering; General Technical Services; Research and Development; Administration; and Engineering Measurement Group Management Headquarters. EG&G support to LANL is experiencing a substantial employee turnover (25 percent annually), largely due to commuting time to NTS. The LANL test diagnostics effort has a critical need to attract and retain highly qualified EG&G support work force. A Las Vegas facility to allow some preevent staging for LANL events, in addition to other diagnostics station work,

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

would aid in this regard. In addition, it would be more desirable and efficient to prestage in Las Vegas rather than NTS, due to the evolution of the LANL diagnostic system to digital recording techniques. A lack of an adequate preevent staging area and engineering complex in Las Vegas, coupled with a deterioration in qualified EG&G personnel, could result in costly event delays and/or loss of valuable diagnostic data in the future.

The LLNL space requirement is driven by current overcrowded conditions and the need to support new multiparameter diagnostic systems and increased mechanical fabrication activities. Additional space for shipping/receiving/storage is needed for all programs. Adequate working space for personnel without security clearance is also needed to conform to DOE security, safety, and property control procedures.

The proposed facilities are also required to replace the present EG&G Sunset Road facility. The need for this replacement is driven by expanded program requirements, the inadequacy of existing space as related to operational requirements, and the pending condemnation of the existing facilities due to a planned new runway at McCarran International Airport. A new runway will be added on land presently occupied by this facility.

The FY 1987 funding will allow completion of construction of the 96,000 square foot facility and the purchase of an existing building as recommended by the Corps of Engineers and completes funding for this subproject.

b. Test Facilities Revitalization, NTS
(TEC $22,300,000; FY 1984 funding $11,200,000; FY 1985 funding $6,600,000; FY 1986 funding $4,500,000; FY 1987 funding $0)

This subproject initiates the revitalization at the NTS in three major functional areas: (1) reconfigure Forward Area camps to replace existing substandard, overcrowded camps and to free-up prime test real estate; (2) test execution support by upgrading facilities to accommodate larger diameter devices and canisters; and (3) initiate an effort to expand and replace personnel support facilities such as housing, dining halls, and recreation facilities.

(1) Reconfigure Forward Camp Areas

The objective of this development plan calls for: (1) relocating facilities in order to access test property; (2) providing larger and more cost-efficient office, shop, and equipment complexes in alternate locations; (3) upgrading and relocating related utilities and access roads; and (4) eliminating substandard facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

(a) Event Power System Upgrade, NTS
(TEC $10,600,000; FY 1984 funding $3,500,000; FY 1985 funding $2,600,000; FY 1986 funding $4,500,000; FY 1987 funding $0)

This subproject, which was initiated in FY 1984, will change the event power distribution system for Areas 1, 3, 4, 6, and 7 from 4.16 kV to 12.47 kV and the site operating voltage from 208V to 480V. The 12.47 kV distribution system will use four portable substations to transform the 34.5 kV subtransmission voltage to a 12.47 kV distribution voltage. The 34.5 kV overhead line at the north end of the test area will be extended to connect to the line paralleling the Mercury highway. Portions of the 34.5 kV line south of the Yucca substation and paralleling the Orange Blossom road will be upgraded. Two substations will connect into the 34.5 kV line running parallel to Orange Blossom road on the east side of Yucca valley and the other two substations will connect into the 34.5 kV line running parallel to Mercury highway on the west side of Yucca valley. From each substation, an underground 12.47 kV circuit will feed a splice can which will be centrally located with respect to the testing areas. Buried 12.47 kV feeders will connect the splice can to a new 12.47/4.16 kV to 0.48 kV event site substation. These substations will provide dual primary voltage in order that the existing 4.16 kV system can be used until the new 12.47 kV system is operational. New 480V or 208/120V substations will be used throughout the event site.

The 34.5 kV line (Orange Blossom) supplying the east side of Yucca Flat is not adequate for power projections over the next few years. Because of increased power demand, the existing 34.5 kV overhead line will be extended and reconfigured into a loop system with portions of the existing 34.5 kV line being upgraded to provide overall dependability, voltage drop requirements, and the capability to sectionalize the line for maintenance and preclude interruptions and delays in test activities.

The power system upgrade is vital to LANL for conducting its test program since the current power configuration is an underground distribution system which has experienced severe deterioration as a result of age and ground motion. System failures and insufficient voltage to event sites are being experienced with increased frequency. These power outages and voltage fluctuations damage electronic recording equipment calibration and affect test signals used in diagnosing nuclear weapons test results. These conditions extend the event times; checkouts take longer; and, more importantly, they increase the risk of receiving erroneous or possibly no data from a test.

Funding is complete for this subproject.

8. Brief physical description of project (contd.)

(b) Field Operations Support Facility
(TEC $1,508,000; FY 1984 funding $200,000; FY 1985 funding $1,308,000; FY 1986 funding $0; FY 1987 funding $0)

This subproject, initiated in FY 1984, will provide a new 16,000-square-foot preengineered metal building to house laboratory, contractor, and DOE personnel in the LLNL test support area.

There are currently 75 supervisory, professional, and clerical personnel housed in deteriorated and crowded trailers disbursed throughout the LANL test support complex. The current trailers have exceeded their use life by 200 percent, are costly to maintain and operate, are uncomfortable, and are not readily or cost effectively modified.

In addition to consolidating personnel and the efficiencies to be gained, the facility will house the 40 percent growth in personnel which is planned in the next several years as a result of programmatic increases.

Funding is complete for this subproject.

(2) Test Execution Support

The objective of this development plan calls for: (1) upgrading facilities' capability and capacity to handle additional and larger devices and canisters; and (2) upgrading facilities used for equipment research and fabrication, calibration, installation, and monitoring to service the proposed balanced test program.

(a) Staging Assembly Tower
(TEC $7,872,000; FY 1984 funding $4,220,000; FY 1985 funding $2,692,000; FY 1986 funding $0; FY 1987 funding $0)

This subproject, which was initiated in FY 1984, will provide a twin tower for use by LLNL at the NLV ATLAS Facility. It will provide a 25-foot-wide by 62-foot-long by 135-foot-high tower with two overhead hoists, four fracture-safe steel columns, and a concrete block enclosure. The tower will be equipped with an elevator, alignment scopes, and welding equipment.

The tower will provide for the assembly and alignment of diagnostic test equipment which collects data on nuclear weapons tests and provides a weatherproof work area for technicians, hardware, and specialized electronics equipment. A fixed amount of time is required for this process for each event, and this twin tower will allow work to be carried on for several events simultaneously. The LLNL test program has moved to heavier and larger diameter devices and canisters and this trend will continue. The current staging assembly tower is not adequate to handle these packages, and an increased test level under a balanced test program would require that assembly

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations
2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

be performed on several devices simultaneously. The new twin tower is required to add operating capacity to handle devices in parallel and to add capability to handle larger and heavier packages.

Funding is complete for this subproject.

(3) Personnel Support Facilities

The objective of this development plan calls for upgrading the form of housing, dining halls, and recreation facilities; the plan's initial phasing calls for the construction of dormitories at Mercury and Area 12.

(a) Dormitories - Mercury and Area 12, NTS
(TEC $2,320,000; FY 1984 funding $2,320,000; FY 1985 funding $0; FY 1986 funding $0; FY 1987 funding $0)

This subproject, which was fully funded in FY 1984, provides for the construction of one Type-A dormitory containing 55 12-foot by 20-foot rooms with individual restroom and shower facilities in a two-story building. The building will have a lobby, a laundry room, a mechanical equipment room, and a janitor's room.

These 55 units will replace a portion of the current four-bed/shared bath trailers, which constitute 60 percent of the housing available at Mercury. The trailer units to be replaced have exceeded their use life by 200 percent, are in violation of DOE fire regulations, and do not provide appropriate or adequate accommodations for personnel who are temporarily assigned to NTS or who must stay on location because of work schedules and operating procedures. The NTS users and contractors believe that adequate, comfortable housing affects the caliber of personnel they are able to attract and retain to work on the nuclear weapons test program.

Improved accommodations are required at the NTS to provide adequate living quarters for scientific and professional personnel who are required to reside at the NTS on a recurring semipermanent basis and also to provide adequate quarters for the permanent Mercury population. Existing housing at Mercury consists of old trailers; wooden communal-type dormitories; concrete block bachelor officer's quarters; and two-story, motel-type dormitories. The acceptable bachelor officer's quarters and motel-type facilities will accommodate only 230 persons. During the first five months of FY 1981, the average monthly peak overnight population was 750 persons. Thus, the monthly peak population exceeds by approximately 350 percent the space available in acceptable facilities. The peak population during an augmented test program is expected to be approximately 1,100 and will severely aggravate the situation.

During peak activity periods, housing scientific and technical personnel in Mercury has two advantages over accommodations in the nearest motels, which are 65 miles away in Las Vegas. First, motel accommodations in

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

Las Vegas would represent a substantial cost to the Government. Second, the travel time (about 2-1/2 hours per day) has a negative effect on efficiency and productivity, especially when these personnel are on extended workdays.

Test Revitalization Capital Equipment, NTS & NLV
(FY 1984 funding $5,000,000; FY 1985 funding $0; FY 1986 funding $0; FY 1987 funding $0)

FY 1985 funding was requested under Project 85-D-102, Nuclear Weapons Research, Development, and Testing Facilities Revitalization, Various Locations.

Lawrence Livermore National Laboratory (LLNL), Livermore, California

a. X-ray Calibration and Standards Facilities, LLNL
(TEC $6,400,000; FY 1984 funding $2,200,000; FY 1985 funding $4,200,000; FY 1986 funding $0; FY 1987 funding $0)

This subproject, which was initiated in FY 1984, provides for: (1) the expansion and upgrade of x-ray characterization equipment and facilities at LLNL, and (2) the acquisition of synchrotron radiation source at the Stanford Synchrotron Radiation Laboratory (SSRL) at Stanford University which makes use of the Stanford Positron-Electron Accelerator Ring (SPEAR).

The first element of this subproject involves the need to improve and replace existing equipment at LLNL, including upgrading of an existing sub-keV x-ray generator. Computer-based control and data acquisition electronics will be provided to facilitate making long and tedious measurements caused by frequent parameter changes and for analyzing and archiving large quantities of data.

The second element of this subproject provides that a new beam line be added to the SPEAR ring which is on land leased from Stanford University. This entails modifications to the storage ring, modifications to an existing high bay facility including the addition of a second floor (2,640 square feet), and the construction of a second story (1,475 square feet) over an adjacent building. The first floor will be a laboratory space housing experimental stations on the new beam lines. The new second floor space will be used for an additional experimental station, separate space for setting up experiments and building mechanical equipment, toilets, a dark room, and storage area.

X-ray diagnostics have received particular emphasis over the past decade, and today they are essential to understanding many nuclear device complexities. This has required the development of a number of new measurement techniques and new types of fast response detectors to characterize absolutely the intensity, time, and energy distribution of weapons-generated x-rays. In the future, laboratory experiments in which weapons conditions are simulated will be possible and will

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

likely require new and unique diagnostics systems. To meet all these requirements, there is an urgent need to improve existing x-ray facilities and to extend radiation source facilities to higher fluxes and shorter pulse widths, and to provide a continuous x-ray energy coverage that is not available from line sources based on available K and L atomic transitions. The synchrotron radiation source will fill that need.

Funding is complete for this subproject.

b. Intermediate Term Facilities, LLNL
(TEC $5,640,000; FY 1984 funding $5,640,000; FY 1985 funding $0; FY 1986 funding $0; FY 1987 funding $0)

This subproject, which was initiated in FY 1984 based upon a congressionally approved reprogramming action, provides for the procurement and installation of two two-story modular facilities (approximately 40,400 square feet and 45,300 square feet each) which will house approximately 276 people in total. These modular facilities are prefabricated light steel frame trailer units, varying in size but largely 12 foot by 60 foot and 12 foot by 56 foot units, which are stacked and bolted together. The facilities provide office and workspace including computer area, conference area, storage and file space, and other support areas.

LLNL has been attempting to find ways to solve a severe temporary housing problem for the last decade. Approximately half of all LLNL employees are currently housed in temporary facilities, a considerable number of which are substandard and long overdue for replacement. The preference has been to construct permanent facilities to meet this deficit, but it is clear that the Federal budget constraints will not allow this solution to be implemented in the necessary time frame. LLNL is in a position where it needs to replace the most inadequate and aged temporary space with new, upgraded space in order to meet laboratory requirements in the interim until permanent facilities can be constructed. The use of larger modular structures, while remaining portable and cost competitive, provide efficient use of space, allow for more continuous location of employees, and use less land when constructed in a two-story configuration.

This subproject will allow the demolition of overaged World War II barracks, help alleviate the "overdense" condition in the southwest quadrant of the LLNL site, relieve existing crowded trailer/building conditions, and allow the consolidation of LLNL operations which are located in a number of locations which will improve operating efficiency.

Funding is complete for this subproject.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

Los Alamos National Laboratory (LANL), Los Alamos, New Mexico

a. X-ray Calibration Capability Upgrade, LANL
(TEC $4,900,000; FY 1984 funding $1,300,000; FY 1985 funding $3,600,000; FY 1986 funding $0; FY 1987 funding $0)

This subproject, which was initiated in FY 1984, provides for: (1) the design, procurement, and installation of beam line components at the National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory (BNL), and (2) the expansion and upgrade of x-ray characterization equipment and facilities at LANL.

The first element of this subproject involves the installation of specialized equipment in two existing and available beam line ports. This consists of installing two beam line interfaces to a synchrotron source; installing beam transport; handling capabilities, sample chambers, and data acquisition and reduction equipment. The second element is the upgrade of x-ray characterization facilities at LANL which will consist of both capital construction and equipment procurement/installation. First, a building addition of approximately 1,000 square feet will be provided to house x-ray source, power supplies, and water chillers. Existing building utilities and air-conditioning will be extended to this addition. Second, modifications will be made to rooms within an existing facility. This will include removing, adding, and relocating partitions and utilities within the building.

LANL weapons program needs state-of-the-art characterized x-ray detectors. The present x-ray characterization facilities are at least 20 years old. Equipment in many cases is out of date and is housed in overcrowded quarters. Modern x-ray detector system developments require new types of characterization facilities in order to support the advanced physics experiments associated with the balanced test program. X-ray diagnostics are essential to determining nuclear device performance characteristics, as well as the characteristics of inertial fusion targets. Continued technology advances have required the development of new measurement techniques and new types of fast response detectors to characterize the absolute spectral, temporal, and spatial distribution of the x-rays generated by these devices. Existing x-ray calibration facilities are approaching their technological limits, and a new generation of x-ray sources will be needed to continue the advance in x-ray diagnostic techniques.

A dedicated synchrotron-radiation beam line would allow performance of measurements more quickly, with high accuracy and better spectral resolution, than was previously possible. The tunability and intensity of the source would allow measurements on integral detector assemblies and at energies that are otherwise unobtainable. These data could increase by an order of magnitude the ability to measure time-resolved spectral emissions in the weapons test program. Synchrotron-radiation measurements can also be used as experimental verification of theoretical models used as input to weapons design.

An example is important experimental measurements to verify calculations of programmatic interest. Similarly, x-ray measurements of materials properties related to weapons design could be facilitated.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

Funding is complete for this subproject.

b. Test Fabrication Facilities, LANL
(TEC $8,000,000; FY 1984 funding $2,500,000; FY 1985 funding $5,500,000; FY 1986 funding $0; FY 1987 funding $0)

This subproject, which was initiated in FY 1984, provides for procurement and installation of special facilities equipment at the LANL test fabrication shop, construction of a dry run and alignment facility, construction of a wire rope harness fabrication and tensile testing facility with provisions for storage of both raw materials and completed assemblies, construction of a painting facility, and relocation of the tensile test equipment.

The special facilities equipment portion of this project includes a horizontal boring mill, a metal cutting production band saw, rail-mounted carts for NTS equipment rack assembly and movement between manufacturing processes, portable welding stations, a 3,200-metric-ton socket press, a socket insertion device, a 750,000-pound load cell, and a 50-ton expandable-type trailer.

The dry run and alignment facility project consists of two 11-foot diameter by 100-foot-deep testing holes; a 25-foot by 50-foot by 100-foot-high, free-standing, enclosed steel frame test tower erected over the test holes; site grading, road improvements, and paving; and utilities including water, natural gas, sewer, steam, condensate, and power. The harness fabrication and tensile testing facility consists of a building approximately 10,000 square feet in area which will be utilized to fabricate and test wire rope harnesses and fabricate weapons test rack assemblies. Relocation of existing tensile test equipment and installation of new deadman anchors will be required. The painting facility portion of this subproject consists of a 2,400-square-foot building with a 20-foot-high bay for final completion and painting of the weapons test rack assemblies.

The purpose of this subproject is to provide for the construction and equipping of a new facility to support the NTS weapons test program and to provide for the procurement and installation of special equipment at the existing fabrication shop to produce weapons test rack assemblies. The existing facilities for down-hole testing and alignment, as well as harness fabrication, are inadequate to meet the physical size requirements of the weapons test rack assemblies planned by LANL. New facilities and special equipment must be provided to meet weapons test program schedules. The existing facilities are not capable of completely handling the alignment of larger diameter weapons test rack assemblies. Alignment is a complicated procedure and surface-mating specifications are very stringent, as are the specifications on vacuum and pressure systems. The new facility will provide a capability to test and equip weapons test rack assemblies up to 10 feet in diameter and wire rope harness diameters of 3 inches.

Funding is complete for this subproject.

1. Title and location of project: Nuclear testing facilities revitalization, various locations   2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

The TEC for this project (84-D-107) increased $300,000, from $78,940,000 to $79,240,000, due to the addition of the Corps of Engineers as construction manager to the project team and escalation adjustments for the Field Engineering Complex, North Las Vegas, Nevada, subproject. The FY 1987 funding for this project fully funds the ten subprojects included in this project.

9. Purpose, justification of need for, and scope of project

This project provides for initiating the most urgent subprojects to revitalize the capital asset base of the nuclear weapons testing complex to assure the capacity and capability of the complex to achieve and maintain a balanced annual test program on a long-term sustainable basis.

The need for a test complex revitalization program was identified in a study completed in January 1982. The study was conducted by a task force comprised of representatives from the Office of Military Application, Nevada Operations Office, and the three weapons laboratories. All aspects of the test complex capital asset base were critically reviewed during the study, and priority resource requirements were developed by year and site within the context of achieving and sustaining a balanced, long-term test program in excess of the FY 1981 level of testing.

Several factors have contributed to the current situation. One such factor is the history of the overall test program itself. The history has been one of great fluctuations and very dynamic programs. These programs have fluctuated over the years due to political uncertainties and shifts in national policy relating to underground nuclear testing and nuclear deterrence. Many of the NTS facilities are temporary, were built 10-20 years ago, and are now completely overage and deteriorated. Within the laboratories, capital funding for facilities dedicated to the test program has been sporadic at best. Many facilities now in use were built originally for other purposes.

Another factor is the combination of increased complexity and workload confronting the program. To a large extent, the requirements for information in the test program mirror the pace and scope of the underlying research and development effort. As designs become more complex and the frontiers of technology are pushed out further in the laboratories, more information of increasing detail is required from each experiment associated with a device test. Today's device tests are much more complicated than tests conducted 10 years ago. Couple this with an overall increase in the DOE and work for others testing workload, and it becomes obvious that additional diagnostic capacity and capability will be necessary at the NTS and the laboratories if the test program is to continue to support the research and development process in a timely and effective manner.

Technology changes are another factor contributing to the need for facilities and equipment. This relates directly to the designer's need for more precise measurements over broader energy spectra. The technology to meet these requirements exists today and can be cost-effectively incorporated in the program to assure maximum scientific output.

1. Title and location of project: Nuclear testing facilities revitalization, various locations
2. Project No.: 84-D-107

9. Purpose, justification of need for, and scope of project (contd.)

The last major factor driving the need for the test complex revitalization effort is the nature and geography of NTS. Many of the NTS facilities were placed in their present locations many years ago to serve a purpose that was appropriate at that time. As test real estate has been used up, some of the facilities, in addition to being old, are not presently in the most advantageous location. Some facilities actually occupy prime test real estate which, as time goes by, is becoming more precious. The lack of real estate at Yucca Flat is beginning to force more tests to Pahute Mesa, especially for those tests near the Threshold Test Ban limitation of 150 kt. Future projections show the test program being conducted on Pahute Mesa. This condition will require new and upgraded facilities in that area in order to keep operating costs down. Facilities are needed in Las Vegas in order to reduce the number of people who have to travel the 70-120 miles to the test site. It has been proven that much of the experimental assembly work can be accomplished in Las Vegas and then moved to NTS for final adjustments, alignments, etc. These facilities are needed in order to attract and maintain the most capable people for the program. Better housing, eating, and recreation facilities are needed at NTS because: (1) many of the existing facilities are substandard, and (2) today's top engineers, scientists, technicians, and craftsmen cannot be attracted to NTS jobs if they must use existing facilities. Some additional facilities are required because of the added workload imposed by the increased test program, coupled with other work being performed at NTS.

This project provides for only a few of the more critical line item construction subproject requirements necessary to support the objective of achieving and sustaining a balanced, long-term test program.

The nuclear weapons development program is made up of a highly complex set of activities extremely dependent on current and advanced technology facilities and equipment to meet its varied needs. In turn, the successful performance of the research and development (R&D) program contributes directly to the quality and reliability of the nuclear weapons stockpile.

The consolidation of the nuclear weapons RD&T revitalization needs into a new FY 1985 initiative focused the issue of the total needs of the RD&T program and is illustrative of the interdependence of the R&D and test programs to: (1) develop and apply nuclear weapons technology to maintain and improve current weapon systems, and (2) develop new weapons for the nuclear weapons stockpile in accordance with national security requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations	2. Project No.: 84-D-107

10. Details of cost estimates a/

	Total cost
a. Engineering, design, and inspection	
b. Construction costs	
(1) Improvements to land	
(2) Buildings and building modifications	$79,240
(3) Other structures	
(4) Special facilities	
(5) Utilities	
c. Standard equipment	
d. Removal cost less salvage	
e. Contingency	
Total estimated cost	$79,240

The estimates by location are as follows:

Nevada Test Site and North Las Vegas ATLAS Facility, Nevada	$54,300
Los Alamos National Laboratory, New Mexico	12,900
Lawrence Livermore National Laboratory, California	12,040
Total	$79,240

11. Method of performance

Design and procurement of the conventional facilities will be performed under negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding. Design and procurement of the special facilities will be performed by the operating contractor.

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a/ Based upon completed conceptual designs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization, various locations

2. Project No.: 84-D-107

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	$48,340	$26,900	$ 4,000	$79,240
Total facility costs	48,340	26,900	4,000	79,240
2. Other project funding				
(a) Conceptual design costs	350	0	0	350
Total other project funding	350	0	0	350
Total project funding (items 1 and 2)	$48,690	$26,900	$ 4,000	$79,590

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design

Conceptual design cost of $350,000 is necessary to develop a budget quality cost estimate and construction schedule.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: General plant projects, Various locations

2. Project No.: 87-D-121

3. Date A-E work initiated: 1st Qtr. FY 1987

3a. Date physical construction starts: 2nd Qtr. FY 1987

4. Date construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: None
Date:

6. Current cost estimate: $32,000
Date: 1/86

7. Financial schedule

Fiscal Year	Obligations	Costs			
		FY 1985	FY 1986	FY 1987	After FY 1987
Prior to FY 1985	$ 0	$13,474	$12,325	$ 1,216	$ 0
1985	27,100	2,946	13,700	10,454	0
1986	28,700	0	8,600	11,500	8,600
1987	32,000	0	0	9,600	22,400

8. Brief physical description of project

This project for general plant improvements includes such construction and/or modifications as roads (onsite and offsite), utilities, minor structures, and technical facilities required in the operation of weapons program installations. A project of this type cannot be fully detailed in advance. The subprojects are examples of items under consideration. In general, the estimated funding for each location and listed subprojects is preliminary in nature and primarily indicative of the size of the subproject and the relative magnitude of the requirements. It should be noted also that the continuing study of requirements will result in changes in scope of some of the subprojects. Other subprojects will be added with the necessary postponement of some of these now included, dependent upon conditions or situations not now apparent.

This project covers requirements of the weapons production complex, the Albuquerque Operations Office and its operating contractors, the Y-12 Plant (under the Oak Ridge Operations Office), and the Y-12 operating contractor.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project

A general plant project is necessary to meet new and changing program developments, to correct deficiencies, and for minor utility and road construction. Research developments and changes in technical program requirements frequently result in the need for altered or new construction items not previously anticipated. In the past, these changes have included additions to buildings to house new equipment for weapons production support functions; construction of new small buildings; extensions or modifications to utilities; and general area development.

The weapons production and surveillance general plant project estimate for FY 1987 of $32,000,000 provides the minimum level of effort essential to meet the existing programmatic requirements, requirements for maintenance and replacement due to the aging of the plants, and other capital facilities.

The following subprojects are examples of items of work which may be performed at the major locations covered under this project. These are grouped by location under the following reason-of-need categories: (1) Health, Fire, and Safety; (2) Pollution Abatement; (3) Maintenance; (4) Safeguards and Security; (5) Programmatic; and (6) Other.

The preliminary estimate of FY 1987 requirements by major area is as follows:

Albuquerque Operations Office	$ 24,600
Oak Ridge Operations Office	7,400
Total	$ 32,000

Albuquerque Operations Office - Weapons Production Complex .... $ 24,600

(1) Health, Fire, and Safety

a. Fire station, Pinellas Plant .... $ 975

This 6,000 square foot fire station will replace the existing 1,970 one truck garage. It will include vehicle bays, equipment storage areas, an extinguisher recharging facility, and firefighter training rooms.

b. Criticality Warning Beacon System, Rocky Flats Plant .... $ 250

This project will supply an internal visual alarm system to each of the major production buildings that include a glovebox air handling system which produces very high ambient noise levels. The use of an aural high-level annunciator for an alarm signal is ineffective as a single mode aural alarm because personnel in these areas wear hearing protective devices.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

c. Body Counter Modification, Rocky Flats Plant .... $ 600

The Body Counter area will be remodeled and enlarged by approximately 800 square feet. Improvements include a new body counter room, another dressing room, separate restroom facilities for men and women, an area for engineering development, and a covered entry way. This will enable the plant to handle the increase in body counts and comply with the Department of Energy (DOE) Order that requires Rocky Flats to do invivo bioassays and analyses to determine radiation exposure of all personnel.

Subtotal - Health, Fire, and Safety .... $ 1,825

(2) Pollution Abatement

a. Waste Management Operation, Bendix Plant .... $ 850

An existing structurally sound pre-engineered metal wall building will be refurbished to provide for consolidation of waste management operation. The refurbishment will include the exterior skin, new insulation, new insulated roof, new doors, new restrooms, construction of offices, and general storage space. Consolidation will improve efficiency and compliance with federal and state regulations governing the management of hazardous waste onsite control of materials and record keeping documents.

b. Environmental Standards Facility, Mound Plant .... $ 900

This 7,500 square foot facility will replace existing facilities that have residual contamination levels with the potential of affecting the reliability of certain analytical results. This facility will provide laboratory and office space for the Environmental Section and space to consolidate the various environmental operations and personnel. It provides laboratory space with low residual background levels for more sensitive analyses, and provides a working environment that is representative of a certification operation which needs to detect and control the increasingly lower levels of pollutants.

c. Hazardous Waste Storage Facility, Rocky Flats Plant .... $ 750

This project will provide storage of nonradioactive hazardous wastes. This will enable the plant to comply with the Environmental Protection Agency regulations for the safe storage of these materials.

Subtotal - Pollution Abatement .... $ 2,500

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

(3) Maintenance

a. Install Condensate Tanks Boilerhouse, Bendix Plant .... $ 640

This project will install insulated tanks in the West Boilerhouse to collect and store condensate return from the steam distribution system. Installation of holding tanks will permit the returned condensate to be reused as a substantial energy source.

b. Chilled Water Secondary System Modification, Bendix Plant .... $ 850

In order to provide the controlled amounts of chilled waterflow required to maintain temperature and humidity control in production areas, the plant will have to convert 10 pumps to variable frequency driver, install bypasses for 24 pumps, replace three-way valves with two-way valves in 26 air handling units, install 46 shutoff valves, and make control modifications to the primary chilled water pumps in the East and West Boilerhouses.

c. Chilled Water System Upgrade, Pinellas Plant .... $ 275

Chilled water mains are to be replaced and upgraded. The existing chilled water mains are old and deteriorating due primarily to normal breakdown of exterior insulating materials.

d. Telecommunicatons Facility, Pinellas Plant .... $ 570

The Telecommunications Operational Model (OPMODEL) is slated to become a major backbone carrier for Department of Energy (DOE) nationwide telecommunications and the Pinellas Plant is one of the sites for which an OPMODEL mode is planned. In order to have a reliable and effective service, they will need to provide for installation of the earth station, time division multiple access electronics, a network management and technical control system, and a video teleconferencing facility.

e. Electrical/Mechanical Utility, Albuquerque, Headquarters .... $ 500

Utility systems presently serving the Headquarters complex are very old and in need of replacement. They include sanitary sewers, water, gas stream, electric, telephone, and fire alarm circuits.

Subtotal - Maintenance .... $ 2,835

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

(4) Safeguards and Security

a. Security Surveillance Upgrade, Pinellas Plant .... $ 300

This project is a continuation of enhancements to the security surveillance assessment and counterforce systems at the plant. It includes additional guard posts, intrusion sensory detection systems, additional exterior lighting, expansion of closed circuit television and related switching equipment, additional vehicle barriers at property entrances, and an obstacle course to support physical training requirements of the inspector force.

b. Security Training Facility and Running Track, Pantex Plant .... $ 600

To meet the increased training requirements for guards at the plant, this facility will require: (1) a classroom for 540 people, (2) a separate armory for a Multiple Integrated Laser Engagement System weapon, (3) a storage area for training equipment, (4) offices for training officers, (5) inside exercise area with associated equipment, and (6) relocation of the obstacle course in close proximity to the exercise track and training facility.

c. Surveillance Closed Circuit Television, Rocky Flats Plant .... $ 660

This project will install closed circuit television cameras on top of each guard tower and on top of three different buildings. Other equipment including a microwave tower, microwave links, zoom lenses, monitor recorders, and controls will also be installed. The project is required to enhance security at the plant.

d. Plant Protection Locker Room Expansion, Rocky Flats Plant .... $ 200

More guards are needed to meet the increased security measures. These additional guards need lockers to store their uniforms and related equipment. This project will expand the plant protection men's locker room by 900 square feet.

e. Remote SECOM Center, Transportation Safeguards Division (TSD), Albuquerque .... $ 500

An alternate SECOM Control Center will be built at a remote location. This center is necessary to provide 100 percent backup and assure continuous communications backup with the Transportation Safeguards Division transporation fleet.

f. TSD Academy Driving Course, Albuquerque .... $ 900

This Vehicle Training Area will be used to train TSD couriers in the routing and emergency operation of tractor/trailers and other convoy vehicles. This site is necessary because no such area exists at this time.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

g. Range Upgrade, Pantex Plant .... $ 500

Improvements will consist of adding wind breakers, redoing the beams, replacing target carriers, and constructing a small building for personnel staging, instruction and weapon cleaning.

h. Southeastern Courier Section - Firearm Range, Oak Ridge .... $ 200

This project will construct a new firearm qualification range for the couriers. They currently share a range with Martin Marietta. As Martin Marietta continues to increase the size of its guard force, it becomes difficult to schedule use of their range.

i. Southeastern Courier Section - Tactical Buildings, Oak Ridge .... $ 750

This project will provide site improvement for the area where TSD will be conducting maintenance.

j. Transportation Safeguards Training Academy, Albuquerque .... $ 850

This project will provide for construction of a Central Supply and Armory Building, a Maintenance Building, and a Truck Driver Training Building. It will also include the modification of an existing supply building into a range classroom, construction of two helicopter pads, and provision of a tractor-trailer work area.

k. Tactical Building, Transportation Safeguards Division Academy .... $ 300

This project will construct two staff office buildings to provide space for a staff of 17.

Subtotal - Safeguards and Security .... $ 5,760

(5) Programmatic

a. Trajectory Sensing Signal Generator Inspection Facility, Bendix Plant .... $ 875

This facility provides a dry environment for the inspection and certification of trajectory sensing signal generators. Moisture has been identified as a cause of cold temperature test failures. Presently they are being handled with other electronic assemblies in nonhumidity controlled areas.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

b. Consolidate and Upgrade Precision Pattern Inspection, Bendix Plant .... $ 470

This project will construct a separate precision pattern inspection area with suspended ceiling to improve cleanliness, factory temperature, utility changes, and lighting. Consolidation of the two areas will permit consolidation of supervisory personnel and improve efficiency.

c. Expand Polymer Plant In-Process Storage, Bendix Plant .... $ 190

A pre-engineered metal building will be located adjacent to the existing polymer building. This additional storage capacity is necessary to accommodate the increasing quantity of intermediate products.

d. Two MEV Van De Graff Facility, Pinellas Plant .... $ 680

This facility will expand the capabilities of the existing accelerator to permit the use of several new types of nondestruction analyses. These new techniques will virtually eliminate the present dependence on outside vendors for high voltage ion beam analysis and will greatly enhance the ability to provide essential quality control analyses in support of the production and development of advanced, high technology products.

e. Plant Office Building, Pantex Plant .... $ 850

This project will provide office space to house 75-80 people. The additional office space is due to the planned increase in personnel to support the intense upgrading of the plant operations and computer applications.

f. Metrology Tooling Facility, Pantex Plant .... $ 800

This expansion will provide additional space to perform technical design interpretation and measurement functions. Extremely crowded conditions make design, evaluation, and measurement functions extremely difficult which can result in erroneous tooling acceptance and safety incidents.

g. Vehicle Maintenance Facility, Pantex Plant .... $ 250

This project will relocate the vehicle maintenance tool crib and provide for general store warehousing. This expansion is needed to house parts for maintenance of the TSD fleet.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

h. In-Process Container Staging Facility, Pantex Plant .... $ 250

This project will provide a staging facility to store protective containers, high-explosive transportation carts, metal trays, and form lines for the containers. These items are used to protect the cables and high-explosive surface during transportation of the components to the assembly cells.

i. Thermal Test Facility, Mound Plant .... $ 650

This project will provide for additional thermal chambers. Thermal environment test programs are increasing in number, complexity, and duration of testing.

j. Space Chiller - Powerhouse, Mound Plant .... $ 650

This project will install a 1,600 ton chiller and associated equipment in the present Powerhouse. It will provide the reliability required in meeting the environmental needs of existing and new production facilities.

k. Primary Explosive Surveillance Facility, Mound Plant .... $ 200

This project will provide space for explosives surveillance. The lack of safety controls and presence of other explosives in disassembly and analytical facilities prevents Mound from providing all requested data to establish baseline information on primary explosive components.

l. Unclassified Machine Shop, Rocky Flats Plant .... $ 900

This project will provide an unclassified machine shop. The existing unclassified machine shop operation is provided by Lake Arbor Machine Shop whose lease expired in July 1984. It was renegotiated to July 1987 at which time the new facility will take over the function.

m. Expansion of Maintenance Fabrication Shop, Rocky Flats .... $ 175

This project will expand the Maintenance Fabrication Shop at the Precision Forge Facility. The expansion is needed to accommodate additional personnel to handle a increase in the workload, new equipment to increase the capability of the shop, and a bridge crane to facilitate work on large equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

n. Graphite and Tool Steel Stone Facility, Rocky Flats .... $ 100

This project will provide space to house inventories of graphite and tool steel materials. This will provide a secure area, with limited access, which will assure better control of the inventory.

Subtotal - Programmatic .... $ 7,040

(6) Other

a. Video Teleconferencing Room, Bendix Plant .... $ 900

This project will provide a facility to accommodate video teleconferencing capability between four DOE installations. This will fulfill the DOE Headquarters request that Bendix Plant be one of the sites.

b. Roof Ramps and Walkways, Bendix Plant .... $ 730

This project will install access ramps and walkways to various pieces of the utility system located on the roof. This will reduce not only the time needed to fix and maintain the utility system, but also wear and tear on the roof.

c. Office Building, Mound Plant .... $ 500

This project will provide a permanent office area. With the additional workforce, the current offices are very cramped causing violations of good safety and housekeeping practices.

d. Influent Tank Repair - Mound Plant .... $ 150

This program will repair one the influent tanks in the worst condition. This tank is an integral part of the concrete building and over the years has corroded with subsequent leakage of contaminated waste water.

e. Administrative Support Building, Rocky Flats Plant .... $ 820

This building will be constructed to provide offices for audiovisual services, a photographic laboratory, and a high-bay audiovisual studio. The Audiovisual Services function is located in three buildings. The consolidation will relocate a nonplutonium related function outside of the Perimeter Security zone.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

f. Administration Building Parking Lot Expansion, Rocky Flats Plant .... $ 180

This will expand the existing parking lot for the Administration Building to accommodate the added personnel.

g. Reverse Osmosis Product Water Storage Pond, Rocky Flats Plant .... $ 550

A new 12 million gallon asphalt-lined pond is needed to provide reverse osmosis product water for reuse in cooling towers and boiler plant makeup. The original ponds that were to be used are contaminated.

h. Office Building Remodeling, Albuquerque .... $ 810

The remodeling of this building will require complete rehabilitation of the existing structure's interior/exterior in order to restore it to meet certain General Services Administration and OSHA standards for office buildings.

Subtotal - Health, Fire, and Safety .... $ 4,640

Oak Ridge Operations Office - Weapons Production Complex .... $ 7,400

(1) Health, Fire, and Safety

a. Preaction Sprinkler .... $ 150

This project will replace the existing degraded sprinkler system with a preaction sprinkler system. The work will include replacement of valves, pneumatic tubing, and associated release devices.

b. Gamewell Cable Replacement .... $ 400

This project will replace the existing system's auxiliary loops inside the major production buildings. The existing system's cable insulation is decayed and brittle and malfunctions of the alarm system are being experienced.

Subtotal - Health, Fire, and Safety .... $ 550

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, Various locations
2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

(2) Pollution Abatement

a. Bear Creek Burial Ground Perimeter Fencing .... $ 400

This project consists of placing an eight foot tall chain link fence around the perimeter of the Bear Creek Burial Grounds. This fence is needed to meet the Tennessee State Department of Health and Education requirements and to enhance overall security.

b. Additional Resource Conservation and Recovery Act .... $ 500

This facility will consist of seven individual cells with dikes, 1-1/2 hour fire rated walls and ceiling, and safety equipment for handling drums of flammable, corrosive, and toxic material. The existing storage area is at a bare minimum and may delay pickup of hazardous waste materials from generators within the plant.

Subtotal - Pollution Abatement .... $ 900

(3) Maintenance

a. Upgrade Power Systems .... $ 850

This project will provide an upgrade to the current electrical power system supporting the Computing and Telecommunicating Division building. The equipment projected to be located in this building through FY 1987 will exceed the current power capacity.

b. Replace Air Handlers, Conference Room, and Central Records .... $ 250

The air-handling units in these two areas will be replaced due to age and deterioration. The existing units cause high maintenance costs, personnel discomfort, and an inadequate atmosphere for records storage.

c. Replace Underground Tower Water Lines .... $ 200

The project will replace all underground lines on this cooling tower. Corrosion has caused leaks in the system and loss of chemicals to the creek. When this happens it is necessary to cut off tower water to process equipment and refrigeration equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, Various locations
2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

d. Central Chilled Water System Connector .... $ 500

This project would connect the development area chilled water system to the chilled water system in the adjacent engineering technology and radiation safety facilities, thereby eliminating the need to replace the obsolete systems and providing a very beneficial cost savings to the plant.

e. Replace Creek Tile .... $ 500

Inspection of the creek tiles has revealed deterioration of a major section of two 54-inch creek tiles. Failure in the tiles could disrupt the movement of coal to the steam plant, block access to several storage buildings, and would effect the storm sewer system for a major portion of the plant.

Subtotal - Maintenance .... $ 2,300

(4) Safeguards and Security

a. Remote Monitoring of Material Access Areas (MAA) Alarms .... $ 995

This project will provide remote monitoring capability to utility operators to assure utility equipment is operating properly, thus assuring that certification requirements for production components and materials are met. The operators are prohibited access to MAA by safeguards regulations.

b. Building Addition .... $ 300

This project will construct office space to accommodate the increase in personnel and consolidate the divisional staff located in several buildings.

c. Special Safeguards Requirements .... $ 500

Improvements and modifications are needed to upgrade the security of the Y-12 Plant. They are identified as modifications to perimeter fencing, security gates, vehicle and pedestrian barriers, security lighting, and assessment devices.

Subtotal - Safeguards and Security .... $ 1,795

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, Various locations

2. Project No.: 87-D-121

9. Purpose, justification of need for, and scope of project (contd.)

(5) Programmatic

a. Office and Training Area .... $ 950

The building will house Electrical and Electronics Services Department offices, training facilities, and a conference room. This will relieve a serious overcrowding condition which currently exists.

b. Women's Changehouse .... $ 400

This project will include structural changes to provide a "clean/dirty" area, piping for adequate shower capacity, and installation of lockers and shoe and clothes bins storage space. The female population in this area has increased significantly and now must change in facilities remote from the work area, thereby reducing productivity and creating unreasonable working conditions.

c. Characterization Laboratory Upgrade .... $ 200

This project would renovate an existing wet chemistry laboratory which is no longer required, thus providing the facility with a small office area and a laboratory for corrosion studies in support of the main surface characterization laboratory. Greater accuracy and reliability of corrosion studies can be achieved through providing an optimum environment where the chance of sample contamination is minimized.

d. Office Modifications .... $ 105

This project will enclose the first floor office area and add a mezzanine for additional office space and a small conference room. This is necessary to end the frustration of noisy and cramped offices and the inefficiency of using conference rooms in other buildings.

e. Construct a Computer Room .... $ 200

A computer room is required to house a host computer which will serve three shops with computer-aided equipment control, computer-based process data collection, and program for data management and statistical analysis. It will provide an adequate power supply, temperature and humidity control, and acoustical wall and ceiling surfaces.

Subtotal - Programmatic .... $ 1,855

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
Various locations

2. Project No.: 87-D-121

10. Details of cost estimate

a. Engineering, design, and inspection ....)	$ 32,000
b. Land and land rights ....)	
c. Construction costs ....)	
d. Contingencies ....)	
Total estimate cost ....)	$ 32,000

11. Method of performance

To the extent feasible, design and inspection will be performed under negotiated lump-sum architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids. In some instances, it will be more economical or timely for design, inspection, procurement, or construction to be done by operating contractors and others already under contract to the Government.

12. Funding schedule of project funding and other related funding requirements

Not applicable.

13. Narrative explanation of total project funding and other related funding requirements

Not applicable.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Short-Range Attack Missile II (SRAM II) Warhead Production Facilities, various locations

2. Project No. 87-D-122

3. Date A-E work initiated: 1st Qtr., FY 1987

3a. Date physical construction starts: 1st Qtr., FY 1987

4. Date construction ends: 4th Qtr. FY 1991

5. Previous cost estimate: None
Date:

6. Current cost estimate: $55,000
Date: 1/86

7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 5,000	$ 5,000	$ 5,000	$ 2,100
1988	21,300	21,300	21,300	12,000
1989	20,200	20,200	20,200	24,000
1990	8,500	8,500	8,500	12,000
1991	0	0	0	4,900

8. Brief physical description of project

This project will provide new and modified building space, new process systems, special facilities and additional equipment needed for production, inspection, and certification of raw materials, components, subassemblies, and final assembly of the warhead currently proposed for the U.S. Air Force Short-Range Attack Missile II (SRAM II).

Production of the new warhead for the SRAM II requires new, revised, or expanded capabilities at the various weapons production plants to meet current weapon design requirements.

Bendix Plant

Capability and capacity equipment to be provided under this project include: a new ultra-precision measuring machine for parts inspection; a compression press to mold high temperature plastic; standards and calibration equipment to support new requirements for electrical, environmental, and mechanical calibrations; and manufacturing, instrumentation, and diagnostic equipment to improve production quality, checkout telemetry units, and perform material analyses and characterizations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Short-Range Attack Missile II (SRAM II) Warhead Production Facilities, various locations

2. Project No. 87-D-122

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8. Brief physical description of project (contd.)

Pinellas Plant

Equipment will be provided for capability and capacity related processing activities associated with the manufacture of neutron generators, lightning arrestor connectors, and quartz digital accelerometers. Equipment will be provided for use in the assembly and testing of lightning arrestor connectors and for material handling in the neutron generator production areas. Fabrication, assembly, and tuning equipment for the quartz digital accelerometer will be provided to manufacture the force sensing elements and perform final frequency tuning.

Pantex Plant

Equipment will be provided for the standards laboratory, material testing laboratory, test fire, and process inspection activities in addition to equipment for production operations in the fabrication and assembly activities. An accelerated aging unit system for compatibility testing of the SRAM II will be provided consisting of a temperature chamber with associated sampling and recording equipment. Instrumentation and equipment for production support and process control are proposed for use in the assembly and testing of the SRAM II. A 20,000-square-foot building addition will be built on the existing weapons assembly training facility for training and certification of assembly workers. The present facility has reached maximum capacity and will not accommodate the requirements of the SRAM II production program.

Mound Plant

Production and testing of components require new and modified equipment for the SRAM II warhead booster assembly, detonators and detonator cable assemblies, and component evaluation equipment for stockpile maintenance. Equipment for support of manufacturing and evaluation will also be provided in order to achieve required sprint capacities. The above equipment will be installed in existing facilities.

Rocky Flats

Additional equipment will be provided at the Rocky Flats Plant to meet capacity requirements in machining, processing, inspection, and laboratory services. The SRAM II production equipment needs include such items as a lathe, grinder, mill, pressure vacuum systems, scanning electron microscope, mass spectrometer, chemical analyzers, and related instrumentation. All equipment will be installed in existing buildings.

1. Title and location of project: Short-Range Attack Missile II (SRAM II)
Warhead Production Facilities, various locations

2. Project No. 87-D-122

8. Brief physical description of project (contd.)

Y-12 Plant

This project will provide equipment, process systems, modifications to existing equipment, and equipment or facility refurbishment. Capacity requirements include the upgrade of an existing pressure vessel for the production of salt components, weld equipment, assembly facilities, dye penetrant facility, refurbishment of life certification and prebake ovens, leak test station, plating equipment, upgrade of controls on an existing hydroform for the production of multiple components, support equipment for material handling, and certification equipment consisting of a diffractometer and networking equipment. Also included are approximately 25,000 square feet of new building space which will provide capacity to overcome the crowded substandard office conditions that exist, as well as provide space and support facilities for personnel working in this program. New capability items include assembly room improvements including procedure stations for subassembly operations, process controls for the hydraulic press area, and specialized material certification equipment.

The FY 1987 funding requested will provide for the Title I and Title II design on the training facility addition, dye penetrant facility, and production support building; the development of specifications, the procurement of long-lead items of equipment and special facilities, and for the initiation of construction.

9. Purpose, justification of need for, and scope of project

This project provides the plant facilities and equipment required to produce the nuclear warhead for the SRAM II. Maximum use will be made of existing capabilities of existing weapon production facilities.

The Bendix Plant will need equipment to meet both capability and capacity requirements imposed by SRAM II design and production rates. The capability items are necessary to support new requirements such as unique electrical, environmental, and mechanical measurements; calibration specifications. The capacity items are required to support production processes; for instance, the five-axis machining center is required to produce squib valves.

The Pinellas Plant will require additional equipment to sustain its neutron generator production capability and to implement new capabilities to produce a quartz accelerometer that is more accurate and reliable than previous technology.

The Pantex Plant's existing assembly training facility has reached its maximum throughput rate for certification of assembly personnel. A temporary building is being planned to help in the short term; however, a permanent facility is required. Equipment needs are of a general nature necessary to support production of any new weapons system.

1. Title and location of project:	Short-Range Attack Missile II (SRAM II) Warhead Production Facilities, various locations	2. Project No. 87-D-122

9. Purpose, justification of need for, and scope of project (contd.)

The Mound Plant will require additional equipment capability and capacity to support the production rate of detonator and stockpile maintenance activities associated with SRAM II production schedule. Additional equipment and modifications to existing solid tritium storage facilities will be required to support a boost system.

The Rocky Flats Plant will need additional equipment capacity in its cold machining areas, its standards and Plutonium analytical laboratories, and its Plutonium Recovery Facility.

The Y-12 Plant will need most of the requested equipment to support salt and plating processes, assembly and subassembly operations, and process control and product certification requirements. As part of the general support requirements, new secure office space is required to house personnel who will work on this program. Additional welding equipment and assembly space will be required to support the complex design requirements.

This system is currently in an early design state and many uncertainties remain to be resolved before final design definition. Therefore, the total estimated cost includes an allowance for design and process uncertainties.

Annual operating costs for the expanded facilities are estimated at $2,000,000. Programmatic costs are estimated at $5,000,000 per year.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Short-Range Attack Missile II (SRAM II) Warhead Production Facilities, various locations

2. Project No. 87-D-122

10. Details of cost estimate a/

	Item Cost	Total Cost
a. Engineering, design, and inspection at approximately 14 percent of construction cost, item b		$ 3,400
b. Construction costs		23,525
(1) Buildings		
(a) Weapons assembly training facility addition, Pantex Plant; approximately 22,000 square feet at about $182 per square foot	$ 4,000	
(b) Weapons production support building, Y-12 Plant; approximately 25,000 square feet at about $80 per square foot	2,000	
(2) Special facilities		
(a) Mound Plant	6,675	
(b) Y-12 Plant	10,850	
c. Standard equipment costs		14,420
Subtotal		$ 41,345
d. Contingency at approximately 17 percent of above cost		6,955
e. Design uncertainties		6,700
Total project cost		$ 55,000

Estimates by location are as follows:

Bendix Plant, Kansas City, Missouri	$ 3,300
Pinellas Plant, St. Petersburg, Florida	6,500
Pantex Plant, Amarillo, Texas	8,500
Mound Plant, Miamisburg, Ohio	8,000
Rocky Flats Plant, Golden, Colorado	4,000
Y-12 Plant, Oak Ridge, Tennessee	18,000
Design uncertainties	6,700
Total	$ 55,000

11. Method of performance

Design and inspection will be performed under negotiated architect-engineer contracts and by the operating contractors. To the extent feasible, procurement and construction will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

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a/ Estimate based on completed or partially completed conceptual designs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Short-Range Attack Missile II (SRAM II) Warhead Production Facilities, various locations

2. Project No. 87-D-122

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	Total
a. Total project funding							
(1) Total facility costs							
(a) Construction line item	$ 0	$ 2,100	$12,000	$24,000	$12,000	$ 4,900	$ 55,000
Total facility costs	$ 0	$ 2,100	$12,000	$24,000	$12,000	$ 4,900	$ 55,000
(2) Other project funding							
(a) Conceptual design	$ 200	$ 0	$ 0	$ 0	$ 0	$ 0	$ 200
Total other project funding	$ 200	$ 0	$ 0	$ 0	$ 0	$ 0	$ 200
Total project funding (items 1 and 2)	$ 200	$ 2,100	$12,000	$24,000	$12,000	$ 4,900	$ 55,200

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	$ 2,000
2. Programmatic operating expenses directly related to the facility	5,000
Total other related costs	$ 7,000

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design
      Conceputal design costs of approximately $200,000 were incurred in the process of developing and improving the project cost estimate and schedule.

b. Total related funding requirements
   It is estimated the programmatic life of these facilities will be about 20 years.

   1. Facility operating costs
      Approximately $2,000,000 per year will be required to cover the cost of utilities, maintenance, janitorial services, and related overhead costs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Short-Range Attack Missile II (SRAM II)
Warhead Production Facilities, various locations

2. Project No. 87-D-122

13. Narrative explanation of total project funding and other related funding requirements (contd.)

    2. Programmatic operating expenses directly related to the facility
    The average annual incremental cost of direct labor, tooling procurement, tooling fabrication, and overhead is estimated at $5,000,000 per year.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Protective clothing decontamination facility, Rocky Flats Plant, Golden, Colorado

2. Project No.: 87-D-123

3. Date A-E work initiated: 1st Qtr. FY 1987

3a. Date physical construction starts: 3rd Qtr. FY 1988

4. Date construction ends: 3rd Qtr. FY 1989

5. Previous cost estimate: None
Date:

6. Current cost estimate: $5,200
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 500	$ 500	$ 500	$ 500
1988	4,700	4,700	4,700	2,700
1989	0	0	0	2,000

8. Brief physical description of project

This project will provide a new, fully equipped facility at the Rocky Flats Plant for washing and drying potentially plutonium-contaminated protective clothing and for cleaning and testing respirators and respirator filters. The facility will support all plutonium processing activities at the plant and will be located within the plutonium area perimeter security zone adjacent to the plutonium analytical laboratory.

The building to be provided by this project will be a 12,800 square-foot, single-story, metal frame, and reinforced concrete slab-on-grade structure with a structurally independent filter plenum. The building will meet Rocky Flats Plant design load criteria for a nonhazardous facility. Approximately 4,000 square feet of the building will be allocated to washing and drying potentially contaminated clothing at a rate of 1,600 pounds per hour. Approximately 2,000 square feet will be allocated to cleaning and testing 800 respirators per day. Storage for clean clothing and respirators will occupy approximately 2,000 square feet. Approximately 1,200 square feet will be allocated to two locker rooms, a lunch and break room, and a small office. The remainder of the space will be used for receiving, sorting, folding, and supply storage.

Special facilities to be provided include the filter plenum system and material handling system. The filter plenum will be an airtight carbon and stainless steel unit supported by a reinforced concrete slab-on-grade. Two stages of high efficiency particulate air (HEPA) filters will be provided to meet health, safety, and environmental requirements for containment of plutonium. An automated material handling system will be installed for delivering clothing and respirators to selected points in the work area.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Protective clothing decontamination facility,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 87-D-123

8. Brief physical description of project (contd.)

Standard equipment to meet the design capacity includes two 400 pound washer/extractors and a 200 pound dryer to be relocated from the existing facility and the following new equipment: two 400 pound washer/extractors, two 400 pound dryers, a cleaning and testing system for respirators and filters, an emergency 45 horsepower boiler steam generator (for dryer heat), and associated minor equipment.

Utilities to be provided include connections to the existing plant-wide steam and condensate system for building and dryer heat. Energy conservation features to be provided include air-to-air heat recovery from the building exhaust stream to supplement heating and cooling of the working areas. Heat recovery from washer waste water and a solar heat collector will supplement the hot water heating requirements for washers. The remaining hot water heating requirements will be supplied by steam from the plant-wide steam system. An electrical substation and emergency generator will be installed.

The new facility will be designed to meet Department of Energy (DOE) standards for air filtration, effluent handling, waste filtration, and related environmental design considerations.

The FY 1987 funding will be used for Title I and II design of the new facility, and for procurement of some long-lead equipment.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to replace an existing inadequate plutonium area protective clothing decontamination facility. The existing facility at Rocky Flats is quite marginal in satisfying today's workload and can only provide one day's inventory. Thus, a serious mechanical failure of more than one day's duration could seriously affect plutonium operations and a new facility is required for production continuity and assurance. Offsite commercial facilities capable of handling potentially plutonium-contaminated materials are not available in the Rocky Flats area. If plant production requirements are to be met in future years, the new facility must be completed.

Plutonium refining and fabrication operations require that workers be provided with respiratory equipment and protective clothing at all times. Supplies of clean protective clothing and respirators are critical to maintaining production schedules and safe work standards. The existing clothing decontamination facility is substandard and requires three-shift operation and frequent maintenance work to maintain operations. The amount of contaminated clothing has increased from 14,500 pounds per week in 1979 to a present workload in excess of 41,000 pounds per week for an increase of 184 percent. The load is expected to increase to over 47,000 pounds per week in the near future, further straining existing capacity. In addition to protective garments, respiratory equipment must also be decontaminated. The number of respirators cleaned has increased from 920 per week in 1979 to a present workload in excess of 1,700 respirators per week, for an increase of over 80 percent. The load is expected to increase to 2,300 respirators per week in the near future. The sorting and storage area in the existing building

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Protective clothing decontamination facility,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 87-D-123

9. Purpose, justification of need for, and scope of project (contd.)

is inadequate. Carts filled with clothing are frequently stored outside, unprotected from the weather, or lined up in the corridors causing unsafe conditions.

Good practice for HEPA filters require that a minimum of two stages of HEPA filters be provided in any facility with a potential of containing plutonium. The existing building has only one bank of filters. Space limitations preclude adding a second stage.

Added equipment and increased personnel levels have allowed the existing facility to maintain a workload that has almost tripled in recent years. There is no longer space for internal expansion in the existing building. The present facility occupies 3,500 square feet in manufacturing building 778. External expansion of the existing facility is impractical since it is bordered on the east by the maintenance machine shop, on the west by an underground process waste pit, and on the north and south sides by numerous underground utility lines.

The existing facility will be converted to maintenance and/or production storage space when vacated. Annual operating costs of the new facility are estimated to be $1,230,000, essentially the same as the cost of operating the existing facility.

10. Details of cost estimate a/	Item cost	Total cost
a. Engineering, design, and inspection at approximately 14 percent of construction costs, item b		$ 500
b. Construction costs		3,500
(1) Improvements to land including roads, fencing, and walks	$ 50	
(2) Building, decontamination facility of 12,800 square feet at about $171 per square foot	2,200	
(3) Special facilities including filter plenum, internal utilities and material handling system	770	
(4) Utilities	480	
c. Standard Equipment including washer and dryer equipment		500
Subtotal		4,500
d. Contingency at approximately 16 percent of above costs		700
Total estimated cost		$ 5,200

a/ Estimate based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Protective clothing decontamination facility, Rocky Flats Plant, Golden, Colorado
2. Project No.: 87-D-123

11. Method of performance

Design will be performed under a negotiated architect-engineer contract. Inspection and procurement will be performed by the operating contractor. Construction will be accomplished by a cost-plus-fixed-fee contractor.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$ 0	$ 500	$ 2,700	$ 2,000	$ 5,200
Total facility costs	0	500	2,700	2,000	5,200
2. Other project funding					
(a) Conceptual design costs	20	0	0	0	20
(b) Other project related costs	0		15	15	30
Total other project funding	20	0	15	15	50
Total project funding (Items 1 and 2)	$ 20	$ 500	$ 2,715	$ 2,015	$ 5,250

b. Other related annual costs (estimated life of project: 20 years)

1. Facility operating costs	$ 1,160
2. Capital equipment not related to construction but related to the programmatic efforts in the facility	70
Total related annual costs	$ 1,230

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Total facility costs
      (a) The construction line item will construct the new facility.

   2. Other project funding
      (a) Other project costs include the costs of preparing the conceptual design report and design criteria before project funds are available, for radiation monitoring and decontamination during construction, and for safety analysis reports when installation is complete.

13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Total related funding requirements

1. Facility operating costs

Facility operating costs include the annual costs for utilities, labor, and materials.

2. Capital equipment not related to construction but related to programmatic efforts in the facility

Programmatic capital equipment will be required in this facility at an annual average cost of $70,000 per year.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Environmental, safety, and health upgrade, Mound Plant, Miamisburg, Ohio
2. Project No. 87-D-127

3. Date A-E work initiated: 1st Qtr. FY 1987
3a. Date physical construction starts: 3rd Qtr. FY 1987
4. Date construction ends: 3rd Qtr. FY 1989
5. Previous cost estimate: None
Date:
6. Current cost estimate: $ 4,300
Date: 1/86

7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 2,400	$ 2,400	$ 2,400	$ 1,000
1988	1,900	1,900	1,900	2,600
1989	0	0	0	700

8. Brief physical description of project

This project will correct several serious long-standing site environmental problems at the Mound Plant. The project is divided into two elements: (1) eliminating process water from the storm drainage system, and (2) upgrading site sanitary and storm sewer systems.

Eliminating Process Water from Storm Drainage System

This subproject consists of removing from the open storm drainage system all single pass cooling water which is now discharging from points throughout the entire plant. Approximately 500,000 gallons of this process cooling water currently enters the open drainage system daily. As a result of this practice, the level of suspended solids occasionally in surface runoff discharged into the Miami River through Mound's main drainage ditch exceeds permit limitations. Discharge of this process cooling water will be prevented from entering the open surface drainage by placing the five major users of single pass cooling water on closed loop cooling water systems. This will remove approximately 400,000 gallons per day of current discharge. The construction required to accomplish this includes installing heat exchange brine loops on four process buildings, installing a boost pump in the brine loop of one existing building, and installing a cooling tower for a closed cooling system on one building. This work will include minor demolition, installation of five- or six-inch brine supply and return lines, insulation, heat exchangers, 4-inch copper process water lines, and associated electrical power service, equipment and controls. The remaining small volume releases throughout the plant will be combined in a process water piping

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, safety, and health upgrade, Mound Plant, Miamisburg, Ohio

2. Project No. 87-D-127

8. Brief physical description of project (contd.)

system and piped to the discharge point or handled on small closed loop package coolers. Adequate instrumentation and monitoring points will be provided in the project to insure no contaminants enter the Great Miami River.

Upgrading Site Sanitary and Storm Sewer Systems

This subproject is the result of a two-year comprehensive study of the Mound storm and sanitary sewer systems to evaluate corrective measures needed to maintain control of sewer discharges. Included in this subproject are repairs to approximately 60 sections (2,700 lineal feet) of sanitary sewer line and approximately 90 sections (3,000 lineal feet) of storm sewer line which are broken or restricted to the point that contaminants seep into the surrounding ground and underlying aquifer. Additional corrections to surface storm drainage deficiencies will contribute to a reduction of the amount of suspended solids contained in storm runoff which is under National Pollution Discharge Elimination Systems (NPDES) permit limitation, and requires control and settling to prevent trace radioactive contamination in local soil from moving offsite.

This subproject will provide three pieces of analytical equipment including both liquid and gas chromotagraphs and a mass spectrometer. This equipment is needed to perform analysis of effluents which is required by existing NPDES regulations governing priority pollutants.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to correct numerous deficiencies to the site storm and sanitary systems and avoid violation of current regulations governing discharge of pollutants. Mound's ability to meet NPDES limits is directly related to correction of the sanitary and storm sewer systems and the current practice of discharging single pass process cooling water into the surface runoff system. It is possible that environmental activist groups will challenge Mound's NPDES permit exceptions in the future and such action could result in significant monetary judgments besides reflecting adversely on Mound, DOE, and local public relations and community acceptance. The DOE Dayton Area Office has already received correspondence from the State of Ohio Environmental Protection Agency (EPA) requiring corrective action to be taken. Mound's major collection conduit for surface runoff is a natural stream channel which empties into the Miami River and the Ohio River, a major navigable waterway. The number of NPDES permit violations by the Mound Plant's existing storm drainage system has resulted in regulatory enforcement action by the State of Ohio EPA. This project will remove process water discharges to the storm sewer systems in order to meet the NPDES permit limitations.

The justification of the two subprojects are as follows.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, safety, and health upgrade, Mound Plant, Miamisburg, Ohio

2. Project No. 87-D-127

9. Purpose, justification of need for, and scope of project (contd.)

Eliminating Process Water from Storm Drainage System

The current NPDES suspended solids limits for the main drainage ditch are restrictive in order to control the quality of process cooling water discharged into the Miami River via the ditch. Because of tight restrictions imposed to control releases of potential suspended solids in process cooling water, permit compliance during storm runoff is difficult, and in most cases, unachievable. Almost all of the suspended solid exceptions during 1984 were not caused by operational discharges but were related to construction/maintenance activities and/or storm runoff. In FY 1984, Mound exceeded its NPDES suspended solids permit limitations on 56 occasions. This magnitude of noncompliance has had a serious impact on permit renewal by the Ohio EPA. By separating process water from storm runoff, the main drainage channel would carry minimal flow except during storm events and the expected future NPDES limitations could be easily met, bringing Mound into compliance with the Clean Water Act. The EPA will also require monitoring of suspended solids during storm events to demonstrate compliance with suspended solids compliance.

Upgrading Site Sanitary and Storm Sewer Systems

The thirty plus years of plant operation without a major project to upgrade and maintain the sanitary and storm sewer system, coupled with facility additions over this same time which have added significantly to the load on these systems, has been brought into sharp focus by recent concerns over environmental pollution. A two-year study recently completed has identified the need for major repairs to the sanitary sewer systems to limit contaminant leakage and infiltration.

10. Details of cost estimate a/

		Item Cost	Total Cost
a. Engineering, design, and inspection at approximately 23 percent of construction cost, item b			$ 670
b. Construction costs			2,920
(1) Utilities		$ 2,710	
(a) Upgrade sanitary and storm sewer systems	$1,310		
(b) Separate process water	1,400		
c. Standard equipment		210	
(1) Environmental analysis equipment	210		
Subtotal			$ 3,590
d. Contingency at approximately 20 percent of above cost			710
Total project cost			$ 4,300

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a/ Estimate based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, safety, and health upgrade, Mound Plant, Miamisburg, Ohio

2. Project No. 87-D-127

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11. Method of performance

Design, inspection, and procurement will be performed by the operating contractor. Installation of standard equipment where required will be accomplished by a combination of the operating contractor and negotiated fixed-price engineering contractors. To the maximum extent possible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
(1) Total facility costs					
(a) Construction line item	$ 0	$ 1,000	$ 2,600	$ 700	$ 4,300
Total facility costs	$ 0	$ 1,000	$ 2,600	$ 700	$ 4,300
(2) Other project funding					
(a) Conceptual design report	$ 100	$ 0	$ 0	$ 0	$ 100
Total other project funding	$ 100	$ 0	$ 0	$ 0	$ 100
Total project funding (Items 1 and 2)	$ 100	$ 1,000	$ 2,600	$ 700	$ 4,400

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	$ 50
Total other related costs	$ 50

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   (1) Other related project funding
      (a) Conceptual design for this project has been completed at a cost of $100,000.

b. Other related funding requirements
   (1) Facility operating costs
      (a) Annual facility operating costs include utilities, maintenance, janitorial services, and related overhead.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Receiving and shipping facility, Pinellas Plant, St. Petersburg, Florida

2. Project No.: 87-D-130

3. Date A-E work initiated: 1st Qtr. FY 1987

3a. Date physical construction starts: 1st Qtr. FY 1988

4. Date construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: None
Date: N/A

6. Current cost estimate: $2,700
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 300	$ 300	$ 300	$ 250
1988	2,400	2,400	2,400	2,000
1989	0	0	0	450

8. Brief physical description of project

This project provides for the construction of a single story receiving and shipping facility, approximately 8,000 square feet, and the procurement and installation of standard equipment required to make this facility fully operational. The new structure will be located on existing Government-owned land within the boundaries of the Pinellas Plant site. This facility will be isolated from the existing Pinellas Plant. It will consist of three loading docks, incoming shipment staging areas, a shipping area for nonweapons-related and weapons-related unclassified materials, offices, and the necessary roads, utilities, paving, and fencing to make the facility operational. The purpose is to minimize the potential damage from an explosive or otherwise damaging device(s) intended to disrupt the nuclear weapons production mission of the plant.

The building will also include a mezzaine office area to conduct required administrative and clerical functions; a chemical storage area for temporary secure storage of materials until release; a break area and restrooms; and a utility room housing housekeeping maintenance equipment and supplies.

The building will be of textured concrete block with reinforced concrete slab ongrade. The roof system will consist of metal decking. The exterior walls will be concrete masonry units with insulation to provide an energy efficient building. Utilities will include extension of the existing plant electrical distribution system, domestic water, and sewage system. New equipment will be provided for use in receiving, security checking, verifying, classifying, paletizing, and staging all equipment, materials, and supplies delivered to the plant. Equipment to be installed will include power dock levelers, a

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Receiving and shipping facility,
Pinellas Plant, St. Petersburg, Florida

2. Project No.: 87-D-130

8. Brief physical description of project (contd.)

powered conveyor serving five work stations, batteries and battery chargers, and an electric general purpose lift vehicle. Other normal storage, handling, filing, and communications warehouse equipment will be included.

The requested FY 1987 funding will be used in Title I and II design and initiation of improvements to land.

9. Purpose, justification of need for, and scope of project

The Pinellas Plant is a key facility with unique capabilities in the production of components for nuclear weapons and is, therefore, an integral part of the national security program. These capabilities require the development, maintenance, and full integration of safeguards and security upgrades to ensure the plant's ability to perform its mission in support of the national security program.

The new facility will enhance security operations by allowing full onsite inspection of all incoming material prior to their being sent to warehousing facilities or the sensitive manufacturing area and by restricting access of commercial delivery and shipping vehicles to a remote area of the plant property. All material entering the plant site could be checked for explosive devices which, if found, could be processed by the proper people without endangering either the main manufacturing area, reducing the potential loss of production, or the large mass of plant personnel. The location of the building on the plant site, outside the security fence, would limit the number of unsecured people inside the secured area which would aid the security force in maintaining the security required for the plant. This project includes procurement and installation of new equipment in order to receive, verify, security check, classify, palletize, and stage all equipment, materials, and supplies.

In addition to security enhancements, the new remote receiving/shipping building will provide classification and palletization for improved inventory control and accommodation of various size and types of delivery vehicles with the use of dock pits and dock levelers.

The shipping function located within the new receiving building will be one of primary dispatching duties. All packing, crating, and addressing will continue to be done in the main plant building. All nonproduction shipments and only nonclassified product will be distributed to uncleared vendor vehicles at this point. All classified materials will continue to be picked up from the main building, thereby insuring the security of the product. This change in procedures will cause a 98 percent drop in the amount of vehicles coming inside the outer and inner security perimeter. During FY 1984 there were 7,840 vendor vehicles entering the plant site, of those only 150 were picking up classified shipments. By utilizing the receiving and shipping facility in this manner, the Pinellas Plant can achieve a high degree of security from possible saboteurs and terrorists who might use this avenue as a means to damage plant and property.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Receiving and shipping facility, Pinellas Plant, St. Petersburg, Florida
2. Project No.: 87-D-130

10. Details of cost estimate a/

	Item Cost	Total Cost
a. Engineering, design, and inspection at approximately 18 percent of construction cost, item b		$ 290
b. Construction costs		1,650
(1) Improvements to land, roads, and fencing	$ 330	
(2) Building	1,090	
(3) Utilities	230	
c. Standard equipment including material handling, support, storage, filing, and communications equipment		285
Subtotal		$ 2,225
d. Contingency at approximately 21 percent of above cost		475
Total estimated cost		$ 2,700

11. Method of performance

Contracting arrangements are as follows:

a. Design, procurement, and construction: Fixed price contract awarded on the basis of competitive bidding.
b. Title III inspection: By architect-engineer contractor under operating contractor surveillance.
c. Equipment will be procured and installed by the operating contractor.

12. Funding schedule of project funding and other related funding requirements

Not applicable.

13. Narrative explanation of total project funding and other related funding requirements

Not applicable.

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a/ Based upon a completed conceptual design.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and location of project: Structural upgrade of existing plutonium facilities, Rocky Flats Plant, Golden, Colorado

2. Project No.: 86-D-122

3. Date A-E work initiated: 1st Qtr. FY 1986

3a. Date physical construction starts: 4th Qtr. FY 1986

4. Date construction ends: 3rd Qtr. FY 1988

5. Previous cost estimate: $7,500
Date: 1/85

6. Current cost estimate: $5,600
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 3,000	$ 3,000	$ 3,000	$ 600
1986 Sequestered	(0)	(180)	(180)	(0)
1987	2,600	2,600	2,600	2,300
1988	0	180	180	2,700

8. Brief physical description of project

This project will provide for structural upgrading of three Class I plutonium facilities at the Rocky Flats Plant. These facilities consist of the fabrication/assembly facility (buildings 707, 707A, 708), the plutonium manufacturing and assembly facility (buildings 776/777), and the plutonium development facility (buildings 779, 779A, 779B). Class I facilities are buildings or groups of buildings in which plutonium is used in manufacturing, processing, recovery, or research and development. Changes in building safety codes have occurred since the above plutonium buildings were built. A detailed structural analysis was performed on the three facilities mentioned to determine if the buildings could withstand the current design basis wind of 150 miles per hour (mph). Structural upgrade is required to meet the current wind loading criteria.

In the fabrication/assembly facility, buildings 707 and 707A, two-story buildings built in 1969, were designed for wind loads of 120 mph and 100 mph, respectively. The concrete columns in these buildings will be strengthened by adding adjacent steel columns to accommodate loads imposed by maximum postulated winds. Building 708, also built in 1969 for a wind load of 100 mph, will be strengthened to overcome weakness in shear overstresses at the base of the exterior wall panels. Steel connecting angles will be welded at each twin-tee stem to provide necessary strengthening.

Manufacturing building 776 and assembly building 777 are two-story structures of structural steel construction. Both were designed for 90 mph wind loading and were built in 1957. Subsequently, several modifications have been made to the

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Structural upgrade of existing plutonium facilities, Rocky Flats Plant, Golden, Colorado

2. Project No.: 86-D-122

8. Brief physical description of project (contd.)

buildings. Modifications to be provided by this project will strengthen the exterior walls by adding a 6-inch reinforced concrete exterior wall to prevent overstressing the existing walls and columns. Uplift of the sheet metal roof by 150 mph winds will be prevented by providing welded studs to anchor the decking to the roof beams. Steel bracing will be added to strengthen the roof beams and the steel beam-to-girder connections will be strengthened by additional welds.

Three buildings in the plutonium development facility require modifications. These are one- and two-story structures with cast-in-place concrete framing, structural steel framing, and a mixture of cast-in-place and precast concrete and masonry. Buildings 779 and 779B were designed for 110 mph wind load and were built in 1965 and 1973, respectively. The exterior walls of these buildings will be strengthened by a 6-inch reinforced concrete addition to the existing walls. The tapered steel roof girders will be strengthened by the addition of structural steel columns. Building 779A, designed for an 80 mph wind load and built in 1970, will have its exterior walls strengthened by the addition of a 6-inch thick reinforced concrete wall.

Upgrading the plutonium buildings under this project will utilize methods proposed by an engineering firm which studied the problem in 1982. Alternative methods will be investigated and final selections will be based on economic considerations.

The total estimated cost of this project has been reduced from $7,500,000 to $5,600,000 as a result of a shortened completion schedule and reduced escalation rates.

The requested FY 1987 funding will complete this project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to upgrade the Class I plutonium facilities at Rocky Flats which do not meet current wind loading criteria and thereby reduce the risk of catastrophic failure due to natural wind forces.

The Rocky Flats Plant has become the focal point of several environmental issues primarily due to perceived hazards involved in handling radioactive materials and some past unintended releases to the offsite environment. Out of public concern for potential health and safety risks associated with Rocky Flats Plant operations, a Colorado task force established in 1974 investigated plant operations and made recommendations. One recommendation was for a comprehensive evaluation of the long-term utilization of the plant. The Department of Energy (DOE) accepted the task and, under the oversight of a Blue Ribbon Citizen Committee (BRCC), released a final report in February 1983. The Long-Range Rocky Flats Utilization Study (LRUS) evaluated four basic alternatives:

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Structural upgrade of existing plutonium facilities, Rocky Flats Plant, Golden, Colorado

2. Project No.: 86-D-122

9. Purpose, justification of need for, and scope of project (contd.)

1. Continue to operate the plant without substantial modification.
2. Modify the plant structures and vital equipment to counteract deficiencies under current design criteria.
3. Decommission all or part of the plant and relocate plant capabilities to other DOE sites.
4. Decommission all or part of the plant and relocate plant capabilities to new facilities at a new site.

The BRCC final report on the DOE LRUS issued in March 1984 concluded that the study is sufficiently thorough and objective to allow decisions to be made regarding relocation or modifications to the Rocky Flats Plant. Subsequently, the DOE analyzed both the LRUS and the BRCC reports to characterize logical courses of action consistent with the two reports.

Two important facts became evident. First, the current level of risk to the public from accidents of record and potential future accidents at the Rocky Flats Plant is much less than routinely accepted risks; and, second, limited facility upgrading would maintain the current low level of risk to the public as the surrounding population increases. The modification options were evaluated in detail to assess the cost-benefit aspects of upgrading the plutonium facilities. DOE decided to upgrade selected facilities which currently represent the source of the highest risk to the public. By strengthening three plutonium facilities to withstand the highest credible wind-loadings, the current risk to the public could be reduced approximately tenfold. Such upgrading would maintain the current low level of risk to the public from accidents at the plant by offsetting any increase attributable to population growth during the next 40 years. Upgrading the selected facilities identified in this project will reduce the contribution of natural phenomena at Rocky Flats to the composite risk from 93 percent to about 9 percent.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 15 percent of construction costs, item b		$ 600
b. Construction costs		4,100
(1) Building 707 - strengthen concrete columns	$ 100	
(2) Building 707A - strengthen concrete columns	100	
(3) Building 708 - strengthen exterior wall panels	100	
(4) Buildings 776/777 - strengthen concrete walls, roof deck, roof beams, and steel columns	2,500	
(5) Buildings 779, 779A, 779B - strengthen concrete walls and roof girders	1,300	
Subtotal		4,700
c. Contingency at approximately 20 percent of above costs		900
Total estimated cost		$ 5,600

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Structural upgrade of existing plutonium facilities, Rocky Flats Plant, Golden, Colorado

2. Project No.: 86-D-122

11. Method of performance

It is proposed that the architect-engineer perform Titles I, II, and III design engineering under a prime, negotiated fixed-price contract with DOE. The design and construction will be performed in phases to minimize the effect on plant production and other essential activities. The construction will be performed by the onsite Cost-Plus-Award-Fee contractor and/or, if security requirements can be satisfied, by competitively bid fixed-price lump sum contractors administered by DOE. Inspection and construction coordination will be performed by the operating contractor's inspection department under the existing contract.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	$ 600	$ 2,300	$ 2,700	$ 5,600
Total facility costs	600	2,300	2,700	5,600
2. Other project funding				
(a) Conceptual design	5	0	0	5
Total other project funding	5	0	0	5
Total project funding (items 1 and 2)	$ 605	$ 2,300	$ 2,700	$ 5,605

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design costs
          The conceptual design costs incurred were $5,000.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Environmental hazards elimination, various locations

2. Project No.: 86-D-123

3. Date A-E work initiated: 1st Qtr. FY 1986

3a. Date physical construction starts: 1st Qtr. FY 1987

4. Date construction ends: 2nd Qtr. FY 1989

5. Previous cost estimate: $39,000
Date: 1/85

6. Current cost estimate: $39,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 8,700	$ 7,700	$ 7,700	$ 4,100
1986 Sequestered	(0)	(460)	(460)	(0)
1987	17,300	18,300	18,300	14,400
1988	13,000	13,460	13,460	13,500
1989	0	0	0	7,000

8. Brief physical description of project

This project provides for the elimination of critical environmental hazards at facilities operated by the nuclear weapons program. Specific details on the individual subprojects follow.

Eliminate waste water contamination - Bendix Plant

This subproject will provide for excavation and removal of contaminated surface materials and new facilities for elimination of discharges contaminated with polychlorinated biphenyl (PCB) liquids from the Bendix Plant storm sewer system to local surface waters. It will also provide a replacement for an old deteriorating hazardous solution storage system. PCB cleanup will involve excavation and removal of soil, gravel, concrete, and blacktop from areas of previous hazardous waste spills and disposal sites.

Elimination of PCB contaminated discharges into local surface waters from the storm sewer system will be accomplished by rerouting the discharges into the sanitary or industrial waste water systems. This work will include new sewer lines from the existing floor drains, foundation drains, and catch basins. In addition, the duct work associated with some air handling systems servicing two molded plastics areas will be replaced due to known PCB contaminated oil film.

1. Title and location of project: Environmental hazards elimination, various locations	2. Project No.: 86-D-123

8. Brief physical description of project (contd.)

A total of 26 new aboveground tanks, complete with auxiliary facilities and equipment (basins and pumps), will be installed for storage of hazardous solutions. The existing underground tanks will be removed from service, the remaining contents removed, and the tanks backfilled with sand to preclude any possible contamination of adjacent areas. The acid and caustic rinse water piping from the main building to the waste treatment lagoons will be replaced with new lines enclosed in a concrete utility trench.

Industrial waste water pretreatment and recycle cooling water plant - Bendix Plant

This subproject will construct an industrial waste water pretreatment facility (total gross area of approximately 160,000 square feet) which is required to meet the Federal and local standards for discharges to the Kansas City, Missouri, sanitary sewer system. This project will include installation of a cooling system and the distribution piping, filters, and connection of equipment to recycle water throughout the main manufacturing plant.

Electrical system PCB elimination - various locations

This subproject will replace old electrical capacitors and transformers which use PCB for the dielectric that now require rebuilding to remain operational. The electric systems at the Bendix, Pinellas, Rocky Flats, and Y-12 Plants; and the Los Alamos National Laboratory include PCB containing equipment that requires replacement.

At the Bendix Plant, 95 PCB capacitors located internally throughout the plant will be replaced with non-PCB capacitors. At the Pinellas Plant, 10 PCB-filled transformers will be replaced and associated switchgear will be upgraded. Thirteen PCB-filled transformers are located throughout the Rocky Flats Plant; these will be replaced, existing switchgear will be changed to assure compatibility, and overall system capacity will be increased to accommodate forseeable electrical loads. This subproject will replace 24 PCB-filled transformers and 3 capacitors located throughout the Los Alamos National Laboratory complex and about 50 PCB-filled transformers located throughout the Y-12 Plant.

A total of 89 medium sized transformers currently on line at the Y-12 Plant are filled with PCB liquid coolant. Approximately 30 of these transformers are to be replaced under Project 84-D-124, Environmental Improvements, Y-12 Plant.

The requested FY 1987 funding will be used for construction of two subprojects at the Bendix Plant (eliminate waste water contamination and industrial waste water pretreatment and recycle cooling water plant). It will also be used to continue replacement of PCB contaminated electrical transformers at all sites.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental hazards elimination, various locations

2. Project No.: 86-D-123

9. Purpose, justification of need for, and scope of project

Eliminate waste water contamination - Bendix Plant

The objective of this construction project is to assure that the Bendix Plant storm sewer effluents comply with the State of Missouri water quality standards and that hazardous waste handling and storage facilities meet groundwater contamination regulations. Missouri water quality standards (10CSE20-7) specifically prohibit the discharge of any measurable quantity of persistent, bioaccumulative, man-made toxic substances such as PCBs to the waters of the state. This subproject is required to eliminate sources of PCB contamination from the Bendix Plant to assure compliance with the facility's current National Pollutant Discharge Elimination System (NPDES) permit.

PCBs are not knowingly discharged by the Bendix Plant nor have materials containing PCBs been used in production processes since 1974. The mold heating and cooling systems which previously used PCB heat transfer fluids were drained, flushed eight times, and refilled with non-PCB heat transfer fluid to achieve compliance with the Toxic Substances Control Act. In addition, process and storm water sources discharging from these specific PCB-using areas were rerouted to meet this facility's original NPDES permit.

Subsequent to these preventative measures, residual levels of PCBs were detected in the storm sewer effluent at decreasing levels. The sources of these PCBs were reasoned to be subsurface contamination resulting from heat transfer system spills prior to the time PCBs were of concern. The levels of PCBs in the effluent continued to decrease to a less than detectable amount with only an occasional excursion occurring, leading to the conclusion that the contamination source was being eliminated through attrition.

Starting in June 1982, however, PCBs began to be chronically detected in two of the storm sewer outfalls and are continuing to be detected in daily samples. Missouri state pollution officials were notified about these detections in accordance with the NPDES permit provisions.

In addition to analyzing known PCB areas within the Bendix Plant to determine corrective action for removal of potential PCB sources, this project will reroute other potential contaminated discharges from the storm sewer system into either the sanitary sewer system or industrial waste water pretreatment facility.

Installation of new aboveground tanks is necessary to meet existing and proposed regulations on groundwater contamination which require that all hazardous waste be stored aboveground with proper containment. The installation of new acid and caustic lines from the main building to the waste water treatment lagoons is necessary due to line breaks and the potential for environmental contamination. Repairs have indicated extensive deterioration and the occurrence of line breaks has increased in recent years. The lines are buried underground, thus posing the threat of undetected leaks; the new lines will be installed in a new concrete utility trench which will provide a means for periodic inspection.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental hazards elimination, various locations   2. Project No.: 86-D-123

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9. Purpose, justification of need for, and scope of project (contd.)

Industrial waste water pretreatment and recycle cooling water plant - Bendix Plant

Contaminants carried in the plant's industrial waste water stream are derived primarily from metal finishing activities and consist of cyanide, metals, and toxic organics. An industrial waste water pretreatment facility is needed to remove contaminants to the level required in the Federal and local rules and regulations for waste water being discharged to a publicly owned treatment works. These rules and regulations are specified by the Environmental Protection Agency (EPA) per 40 CFR, Parts 403 and 433.

Currently, the untreated industrial waste water is pumped to lagoons to effect decontamination via settling. This cleaned waste water is subsequently discharged to the publicly owned treatment works. However, due to the deteriorated state of the lagoons, the waste water is not being cleaned to the level required by the regulations for discharge. In addition, the eroded state of the lagoon dikes is an environmental hazard due to the potential for contamination of the ground water.

The new pretreatment facility will remove contaminants from the waste water prior to pumping to the lagoons. Depending on the efficiency of the pretreatment process, the lagoons will probably no longer be needed and will, therefore, be demolished. If the settling step is still desired for a final safeguard before discharge, the lagoons will be upgraded.

The pretreatment process will also condition the waste water for use in the plant's process cooling systems in order to preclude corrosion and scaling when recycled to the plant process cooling systems. Recycling waste water will reduce the annual cost of water used for process systems.

Electrical system PCB elimination - various locations

As specified by the EPA in 40 CFR, Part II on PCBs, rebuilding PCB contaminated electrical equipment is prohibited. This subproject will replace the equipment requiring rebuilding in order to remain operational.

Capacitors containing PCBs are addressed in 40 CFR 761.30 as follows, "After October 1, 1988, the use of PCB large high voltage capacitors and large low voltage capacitors is prohibited unless the capacitor is used within a restricted-access electrical substation or in a constrained and restricted-access indoor installation. A restricted-access electrical substation is an outdoor, fenced, or walled-in facility that restricts public access and is used in the transmission or distribution of electric power. A contained and restricted-access indoor installation does not have public access and has an adequate roof, walls, and floor to contain any release of PCBs within the indoor location."

Building modifications to provide restricted-access containment for the existing PCB capacitors would exceed (possibly 4 to 5 times) the cost of replacing the capacitors.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental hazards elimination, various locations

2. Project No.: 86-D-123

9. Purpose, justification of need for, and scope of project (contd.)

EPA has recently published information that states when PCB, or PCB-contaminated equipment, is exposed to fire, two of the most deadly compounds known may be released. In recent years, several buildings in the United States have been abandoned for long periods of time due to these compounds resulting from fires involving PCB transformers. Contaminated soot from the fires was spread throughout the buildings via the ventilation ducts. An 18-story building in Binghampton, New York, has been closed since February 1980. The first six floors of an office building in San Francisco contaminated by a PCB fire were closed for about 15 months. The cleanup cost was approximately $20,000,000. The rags used to remove the contamination from this building were so toxic that they required disposal as a toxic chemical waste.

The weapons production facilities and laboratories are critical to national security. A PCB fire at any of these sites which would result in even a partial loss of one facility would be very grave. The risk of toxic chemical contamination can be eliminated by installing equivalent non-PCB replacements. Since much of the PCB equipment is nearing its designed life expectancy, the cost of its replacement is reasonable.

Without the corrective measures to be provided by this project, there will be the potential for noncompliance citings at the Bendix Plant. In addition, operations will be threatened by continued usage of electrical systems requiring rebuilding.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 13 percent of construction costs, item b		$ 1,600
b. Construction costs		12,600
(1) Site improvements	$ 100	
(2) Building	9,860	
(3) Utilities	2,640	
c. Equipment including replacement transformers and capacitors		18,200 b/
Subtotal		32,400
d. Contingency at approximately 20 percent of above costs		6,600
Total estimated cost		$39,000

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a/ Estimate is based on completed conceptual design.

b/ Replacement of transformers and capacitors may be accomplished at some sites by individual construction contracts requiring removal, replacement, and proper disposal of PCB contaminated equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental hazards elimination, various locations

2. Project No.: 86-D-123

10. Details of cost estimate (contd.)

The estimates by location are as follows:

Bendix Plant, Kansas City, Missouri	$15,000
Pinellas Plant, St. Petersburg, Florida	4,300
Rocky Flats Plant, Golden, Colorado	1,800
Y-12 Plant, Oak Ridge, Tennessee	7,600
Los Alamos National Laboratory, Los Alamos, New Mexico	3,700
Contingency, all sites	6,600
Total	$39,000

11. Method of performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$4,100	$14,400	$13,500	$ 7,000	$39,000
Total facility costs	$4,100	$14,400	$13,500	$ 7,000	$39,000
2. Other project funding					
(a) Conceptual design costs	$ 190	$ 0	$ 0	$ 0	$ 190
Total other project funding	$ 190	$ 0	$ 0	$ 0	$ 190
Total project funding (items 1 and 2)	$4,290	$14,400	$13,500	$ 7,000	$39,190

b. Other related funding requirements (estimated life of project: 20 years)	
1. Facility operating costs	$ 3
Total other related funding requirements	$ 3

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental hazards elimination, various locations

2. Project No.: 86-D-123

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
    1. Other project funds
        (a) Conceptual design costs
            Conceptual design for this project was prepared by the operating contractor at a cost of $190,000.

b. Other related funding requirements
    It is estimated that the programmatic life of this project is 20 years.

    1. Facility operating costs

        Facility operating costs of $3,000 annually includes operating labor, equipment maintenance, and supplies.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and site security upgrading, Phase II, Mound Plant, Miamisburg, Ohio	2. Project No.: 86-D-124
3. Date A-E work initiated: 1st Qtr. FY 1986	5. Previous cost estimate: $5,000 Date: 1/85
3a. Date physical construction starts: 4th Qtr. FY 1986	
4. Date construction ends: 2nd Qtr. FY 1989	6. Current cost estimate: $5,000 Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 3,000	$ 2,000	$ 2,000	$ 700
1986 Sequestered	(0)	(120)	(120)	(0)
1987	2,000	3,000	3,000	3,300
1988	0	120	120	800
1989	0	0	0	200

8. Brief physical description of project

This project will provide safeguard upgrading to improve Mound's current security posture. Construction of these facilities will permit Mound to perform effectively its security mission both now and in the future. The current scope of this project consists of the following subprojects:

- Security Operations Facility
- Special Materials - Plutonium Processing (SM-PP) Precinct Building
- Alarm Display and Communications System

Security Operations Facility

This project provides for the construction of a three story free standing facility, approximately 11,400 square feet. The building will be a concrete construction and will have connecting corridors to an adjacent building. This facility consolidates various security staff functions which have been temporarily housed in locations remote to one another. The facility will include an emergency operation center as well as the hardened security alarm and communications center. In addition, the building will house technical security development and tempest testing activities, a locksmith shop and vault, office space consolidating security staff functions, and conference/classroom space.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Mound Plant, Miamisburg, Ohio

2. Project No.: 86-D-124

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8. Brief physical description of project (contd.)

Special Materials - Plutonium Processing (SM-PP) Precinct Building

This subproject provides for the construction of a single story concrete structure, approximately 5,800 square feet. This building replaces temporary protective forces facilities and includes change/locker rooms; restrooms; SWAT storage and training areas; alternate alarm display and communications center; armory; garage; hardened observation post; and a ready area that is needed to accomodate approximately 60 security personnel.

The building will be hardened. A hardened observation post will improve site surveillance. This building will greatly improve the protective forces' response time.

Alarm Display and Communications System

The Alarm Display and Communications System (ADCS) subproject provides for the design, procurement, and installation of an alarm display and communications system. The ADCS will include two Safeguard Control Centers. One control center will be located in a hardened area within the Security Operations Facility. The second center (alternate center) will be located in the hardened Security Precinct Facility.

The scope of this project has altered somewhat from the prior request due to a number of influences. The current scope reflects a clearer understanding and interpretation of threat guidance and site specific protective systems design techniques. The scope also includes findings of results from a Department of Energy (DOE) Inspection and Evaluation audit.

The FY 1987 funding request will allow completion of this project.

9. Purpose, justification of need for, and scope of project

Recent evaluations of the Mound Plant have determined the need for the proposed facilities and alarm and communications systems to enable Mound to respond more effectively to the threat spectrum outlined in part in the DOE threat criteria. Over the past year, Mound has initiated action to increase its security/guard force manpower and improve the nature and extent of its guard force, particularly in training, response tactics, communications, and command and control.

Currently, security management/administrative personnel are located in several geographically separated unhardened buildings in the main manufacturing area. The first and second floors of the Security Operations Facility will provide much needed space for Mound's security management. With this arrangement, security personnel will be able to carry on their day-to-day business in a much more coordinated and effective manner. Additionally, consolidation of security management/administrative personnel within a single facility will result in improved productivity and effectiveness. Also, planned space for the Emergency Operations Center should be adequate for current and anticipated requirements for many years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Mound Plant, Miamisburg, Ohio

2. Project No.: 86-D-124

9. Purpose, justification of need for, and scope of project (contd.)

The current primary security alarm and communications center has identified security weaknesses. The current emergency operations center is too confined and is unacceptable for protracted situations. In addition, there are no facilities available for tempest testing or technical security development/evaluation activities.

The new SM-PP Precinct Building will provide the badly needed space in the right location to comply with Mound security needs. During the past year, the protective force has increased resulting in an over crowded condition. All protective force personnel are currently housed in a single change room in an unhardened building located on the protected area perimeter.

The existing alarm and communications system is unsuitable for Mound's long-term security needs. The system needs upgrading to ensure the ability to collect alarm data and present information which promotes rapid assessment and response.

Recent evaluations of the Mound Plant have determined the need to harden areas where special nuclear materials (SNM) is stored and handled and to improve the level of detection assessment and response against penetration of the site and removal of SNM. This upgrading project consists of eight items which have been developed to provide a coordinated, well-balanced improvement to the storage, control, and protection of SNM and to provide a more secure environment to the entire Mound Plant.

These improvements provide the corrective action to weaknesses identified by recent evaluations of the Mound Plant. Over the past year, Monsanto has initiated action to increase its guard force manpower and improve the nature and extent of its guard training, particularly in response to tactics, communications, and command and control. The request for an additional armored vehicle, the outdoor training area, hardened guard posts, the surveillance locations, and site modifications all relate to improving the overall guard force responsiveness and effectiveness.

This project is required to enable Mound to respond effectively to the threat spectrum outlined in part in the DOE threat criteria.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Safeguards and site security upgrading, Phase II, Mound Plant, Miamisburg, Ohio

2. Project No.: 86-D-124

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10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 15 percent of construction costs, item b		$ 550
b. Construction costs		3,700
(1) Site improvements	$ 250	
(2) Buildings (Precinct 5,800 square feet at approximately $131 per square foot, Operating facility 11,400 square feet at approximately $123 per square foot)	2,150	
(3) Utilities	250	
(4) Special facilities	1,050	
c. Standard equipment		25
Subtotal		$4,275
d. Contingency at approximately 17 percent of above costs		725
Total estimated cost		$5,000

11. Method of performance

DOE will secure all architect-engineer services and the major building and construction contracts.

Mound Research Corporation (MRC) may secure design and construction support, monitoring and management assistance depending upon in-plant workloads. Assistance in this area may be requested from MRC's Corporate Engineering Department or contracted to an outside Engineering Management firm if our workloads are too heavy to cover adequately the project.

All special facilities, design procurement, and construction shall be performed by MRC.

12. Funding schedule of project funding and other related funding requirements

Not required.

13. Narrative explanation of total project funding and related funding requirements

Not required.

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a/ Based upon completed conceptual design.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

3. Date A-E work initiated: 1st Qtr. FY 1986

3a. Date physical construction starts: 3rd Qtr. FY 1986

4. Date construction ends: 1st Qtr. FY 1988

5. Previous cost estimate: $10,000
Date: 1/85

6. Current cost estimate: $10,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$1,500	$1,500	$1,500	$1,000
1986 Sequestered	(0)	(90)	(90)	(0)
1987	8,500	8,500	8,500	5,000
1988	0	90	90	4,000

8. Brief physical description of project

This project includes four subprojects as described below, all of which are to enhance the overall security posture of the Pantex Plant.

Subproject A - Command center expansion.
Subproject B - Emergency lighting upgrade and armored vehicle garage.
Subproject C - Administrative services facility.
Subproject D - Vehicle entrance guard station.

a. Subproject A - Command center expansion

This subproject provides an addition to the security command center (SCC) of approximately 7,600 gross square feet and the modification of existing floor area of approximately 1,200 gross square feet. Construction of the proposed expansion will be of similar materials and methods used in the existing facility. Cast-in-place reinforced concrete columns, beams, and roof slab will be used with precast concrete panels for exterior walls. Site work will consist of paving and revised drainage to accommodate the expanded facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

8. Brief physical description of project (contd.)

The addition and modification to the SCC will provide space to support the security operations which have expanded in size and scope of responsibilities. This space will provide for the following major needs: (a) uniform and equipment storage room to relieve overcrowding problems and the use of a temporary module, (b) exercise room to house equipment to be used by members of the rapid response team in a strenuous exercise and weight program on a daily basis at the plant, (c) weapons training room to conduct weapons training for various guard groups which is currently conducted in a rapid deployment vehicle garage after the vehicle is removed, (d) armored vehicle garage to house two vehicles designated as mobile command center vehicles--one vehicle is on hand and one is planned to be added in the future, and (e) enlargement of the muster/training room to accommodate the increase in guard force levels--the room serves as a briefing/debriefing area for each shift.

b. Subproject B - Emergency lighting upgrade and armored vehicle garage

The existing mercury vapor light fixtures, on eight 100-foot-tall light towers, will be replaced with nine (each) 2,000-watt incandescent light fixtures and nine (each) 400-watt high-pressure sodium light fixtures. These lights will only be used in emergency situations in order to assist in resolving security-related problems. The incandescent fixtures provide the "instant on" characteristics required in an emergency security situation. This subproject also provides for the rehabilitation of the above eight existing 100-foot-tall steel light towers which are in the weapons and high-explosives staging area. The existing ladder and walking-working surface of the towers do not comply with the existing safety standards.

An armored vehicle garage consisting of 625 square feet (25 feet by 25 feet) of floor space is required to handle existing and future armored vehicle requirements within the weapons and high-explosives staging area. The building will provide two bays with 10-foot by 12-foot electrically operated overhead doors and a space in the rear of the garage for weapons cleaning and inspection. The building will be constructed of reinforced masonry with a steel joist, metal deck, and built-up insulated roof. An electrical space heater will be required to maintain heat during the winter and no cooling will be required. There presently is no facility to house and protect an armored vehicle with loaded weapons in the area.

c. Subproject C - Administrative services facility

This subproject provides a new office building of approximately 31,000 square feet (44 feet by 216 feet) to be located at the Pantex Plant's east entrance which will house nonbadged personnel, such as vendor representatives.

This facility will house approximately ten support functions, most of which are presently being conducted in the existing administration building, located deep within the plant's boundary.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

8. Brief physical description of project (contd.)

The building will be constructed with a frame of steel columns and beams, steel joist, metal deck and built-up roof system, and a reinforced concrete masonry and face brick exterior. Interior walls will be constructed of steel studs and vinyl-covered gypsum board. Individual offices will be separated by 5-foot-high vinyl-covered movable partitions. All areas with the exception of the mechanical room, small parcel receiving area, and service representative work area will have an acoustical tile ceiling providing a minimum nine-foot ceiling height. Standard office furniture is included in this subproject.

Site work will include the construction of a sewer line and a water line loop meeting domestic requirements as well as fire protection requirements for the new facility. Access roads, parking area, landscaping, and an automatic lawn sprinkler system is planned.

Electrical service will be provided by the upgrading of an existing overhead power line.

d. Subproject D - Vehicle entrance guard station

This subproject consists of a hardened guard station, approximately 144 square feet (12 feet by 12 feet), and approximately 450 linear feet of a 24-foot-wide asphalt access road to an existing perimeter road and approximately 880 linear feet of a new 40-foot-wide asphalt surfaced road. Bullet-resistant glass and doors will be used in the station and gun ports will also be provided.

Construction materials will consist of cast-in-place concrete walls and structural steel tube columns supporting a precast concrete roof slab. Electrical power will be provided from an existing underground electrical duct system extended underground to a pad-mounted transformer located near the new facility.

The new access road will cross an existing sensor bed and modifications to the individual sector involved will be required. Electrically operated gates will be installed in the existing fence lines on both sides of the sensor bed and will be controlled from the new guard station and the existing guard tower. The station will include auxiliary equipment consisting of surveillance cameras, a water cooler, two radiation detectors, telephone, and weapons cabinet.

The FY 1987 funding will be utilized for the award of a construction contract for the four subprojects included in this project.

9. Purpose, justification of need for, and scope of project

In recognition of the continuing threat of international terrorism and the concern for the unique production capabilities of the Pantex Plant, the proposed measures to eliminate potential vulnerabilities to surprise attack and to assure that the

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

9. Purpose, justification of need for, and scope of project (contd.)

Pantex guard force is prepared and equipped to respond quickly and decisively to an aggressor force as characterized in the threat spectrum are required. The proposed construction projects for Pantex are necessary to correct some basic inadequacies in plant security and to enhance the detection and response capabilities of the guard force through improved lighting in the staging area and installation of a protective garage for armored vehicles.

a. Subproject A - Command center expansion

The Security Command Center (SCC) serves as the headquarters for the uniformed guard force. The facility provides space for administrative offices, communications center, armory, muster/training room, change rooms, and storage. The building is seal-hardened and would serve as the security operations command post in the event of an armed attack on the plant.

The command center was originally designed to accommodate 178 uniformed guards (156 male, 22 female). At present, there are 239 uniformed guards (223 male, 16 female) on the force. The security division predicts an estimated 345 uniformed guards by FY 1992. The growth in the security force can be attributed to various factors. Some of these are: construction escort demands, Department of Energy security directives, and plant security upgrades. Due to these personnel increases, the command center needs to be expanded in various areas.

The muster/training room serves as a briefing/debriefing area for each shift. All shift duties are discussed with the guards at the onset of each shift in the muster/training room. This room needs to be expanded to accommodate the increase in guard force levels.

Members of the rapid response team will be required to participate in a strenuous exercise and weight training program on a daily basis at the plant. This program will require additional area to house the necessary equipment.

The existing command center has three garage stalls which house two armored personnel carriers and a rapid response vehicle. Recently, one new vehicle designated as a mobile command center was added to the force. One more mobile command center vehicle is planned in the future. These vehicles are part of a rapid deployment force that would be needed at a moment's notice in the case of a plant intrusion. If the vehicles were kept outdoors, it is possible that in cold weather they would not start. In case of snow, the drifts could be such that the vehicles would have to be dug out to mobilize them. In the case of an emergency, the delay could be catastrophic.

The garage area is also currently utilized to present weapons training classes to various guard groups. To conduct a weapons training class, a rapid deployment vehicle is removed from the garage to provide adequate space. A separate area is required to house adequately a weapons training room.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

9. Purpose, justification of need for, and scope of project (contd.)

The security force must maintain an inventory of uniforms, overalls, coats, leather goods, and other related equipment. A temporary modular building is being used to provide storage space for this inventory. Space will be provided by this project for storage of this equipment and replace the temporary storage area.

Approximately 300 square feet of additional space will be provided in the communications room to support the expansion of the communication and closed-circuit television surveillance requirements.

b. Subproject B - Emergency lighting upgrade and armored vehicle garage

The weapons staging igloos and shipping facilities occupy approximately 120 acres. This area is currently protected by a double fence and sensor bed around its lighted perimeter. At present, due to the substandard climbing assemblies on the towers, safety considerations do not permit any maintenance of the existing mercury vapor light fixtures. This project will provide for the abandonment of the existing substandard climbing ladders and the addition to each of the eight towers, a climbing ladder attached to the outside of the tower that meets current safety standards.

Mercury vapor lights, though more efficient than incandescent, do not permit the immediate activation to light levels that are required for adequate response to an alarm. The proposed modification from mercury vapor lights to a combination of nine incandescent fixtures and nine high-pressure sodium fixtures per tower will provide the required footcandles immediately. Proper lighting is an absolute necessity to effective control and surveillance.

Present regulations require an armored vehicle with loaded weapons in place to be ready and staged within the weapons and high-explosive staging area. There is at present no facilities to house and protect the vehicle and weapons from severe weather, thus creating the potential for making both the vehicle and weapons inoperable due to temperature, moisture, and dust. The proposed garage will provide protection from the elements and the added reliability required of the vehicle and its weapons. Armored vehicles are an essential element of the special security response force at Pantex.

c. Subproject C - Administrative services facility

The increased concern over the possibility of attack or sabotage has prompted the DOE to propose removing administrative support and other support functions from an area adjacent to the production area. This proposal will significantly improve security control and boundary surveillance measures by eliminating a large number of uncleared personnel access to the central areas of Pantex. Removal of nonoperational accesses, in coordination with the improvements to badge and access control measures, will significantly reduce the chance of surprise penetration under pretense.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

9. Purpose, justification of need for, and scope of project (contd.)

Currently, it is necessary for all nonbadged personnel such as vendor representatives, those seeking employment, employees with lost or forgotten badges, relatives of employees with plant business, and official visitors, to go to the existing administrative facility area.

Since all the functions requiring access by the nonbadged personnel are housed in or near their existing administrative facility, security would be enhanced by relocating those unclassified activities that deal primarily with nonbadged personnel to the outer plant entrance. The delivery function could be improved by providing security escorts at the plant entrance for those deliveries requiring access to areas deep within the plant. By including areas in the new facility for service representatives to work on defective office equipment, etc., Credit Union offices, and by providing a small parcel receiving area, the need for penetration of nonbadged personnel deep within the plant area will be greatly reduced.

d. Subproject D - Vehicle entrance guard station

At the present time, there are three entrances to the classified manufacturing high-explosive and special nuclear materials operational area. Two guard station entrances are for personnel only while a third guard station entrance will allow vehicular traffic. The third guard station is located to permit vehicular traffic between four distinct areas.

(1) General plant area.
(2) Classified office and shop area of production line area.
(3) Classified manufacturing high-explosive and special nuclear material operational area.
(4) Classified plant area such as development, test fire, vehicle maintenance, and weapons staging.

Since the third guard station (vehicle entrance) is the only entrance/exit for all these different areas, the vehicle congestion often is a problem. All commercial trucks must go through this entrance to deliver the material and supplies to the warehouse. All weapon movements between the manufacturing area and the staging area must pass through this point. However, this point is adjacent to the unsecured area of the plant; i.e., the cafeteria parking lot and access road. There is a risk in that it is possible for an individual to drive a vehicle through the fence and into a shipment of weapons. A new station that is removed from the unsecured area is needed to eliminate this possibility. It will also permit smoother traffic flow through the area.

This subproject is required to enhance the movement security of weapons and components between areas and also to eliminate the congestion which currently exists at the only other vehicular gate.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 18 percent of construction costs, item b		$ 1,300
b. Construction costs		7,300
(1) Improvements to land	$ 1,060	
(2) Buildings (4 buildings)	4,110	
(3) Other structures (rehabilitate towers)	65	
(4) Utilities	1,705	
(5) Building equipment	360	
Subtotal		$ 8,600
c. Contingency at approximately 16 percent of above costs		1,400
Total estimated cost		$10,000

11. Method of performance

It is recommended that all work be accomplished as follows.

a. Design and engineering (Titles I and II) will be on the basis of a negotiated fixed-price contract administered by DOE to an architect-engineer. Inspection (Title III) services and construction management will be administered by a designated construction manager. Partial Title III services will be provided by the selected architect-engineer.

b. Construction will be accomplished by an outside construction contractor operating under a fixed-price, lump-sum contract to be awarded on the basis of competitive bids and administered by the designated construction manager. Contractor support such as temporary security barricades and Government-supplied items will be furnished and installed by the operating contractor, Mason & Hanger-Silas Mason Co., Inc.

c. Final connections of new communications and detection systems for the facilities will be accomplished by the operating contractor, Mason & Hanger-Silas Mason Co., Inc.

d. Certain items of standard equipment will be procured and installed by the operating contractor, Mason & Hanger-Silas Mason Co., Inc. This includes such items as office furniture, tables, shelving, etc.

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a/ The above estimates are based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Phase II, Pantex Plant, Amarillo, Texas

2. Project No.: 86-D-125

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1986	FY 1987	FY 1988	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$ 0	$ 1,000	$ 5,000	$ 4,000	$10,000
Total facility costs	0	1,000	5,000	4,000	10,000
2. Other project funding					
(a) Other project related costs	50	0	0	0	50
Total other project funding	50	0	0	0	50
Total project funding (items 1 and 2)	$ 50	$ 1,000	$ 5,000	$ 4,000	$10,050

b. Other related funding requirements (estimated life of project: 25 years)

1. Facility operating costs	$ 125
2. Programmatic operating expenses directly related to the facility	725 a/
Total other related costs	$ 850

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design

The cost of the conceptual design prepared for this project was $50,000.

b. Total related funding requirements
   1. Facility operating costs

Facility operating costs of $125,000 are projected to cover maintenance, janitorial, and utilities for the project.

   2. Programmatic operating expenses directly related to the facility

Programmatic operating costs and estimated manpower cost required to support this project.

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a/ Excludes direct material.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Tritium loading facility replacement, Savannah River Plant, Aiken, South Carolina

2. Project No.: 86-D-130

3. Date A-E work initiated: 1st Qtr. FY 1986

3a. Date physical construction starts: 1st Qtr. FY 1987

4. Date construction ends: 3rd Qtr. FY 1990

5. Previous cost estimate: $120,000
Date: 1/85

6. Current cost estimate: $120,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 5,000	$ 5,000	$ 5,000	$ 4,700
1986 Sequestered	(0)	(300)	(300)	(300)
1987	30,000	30,000	30,000	29,000
1988	51,500	51,500	51,500	45,000
1989	33,500	33,800	33,800	26,000
1990	0	0	0	15,300

8. Brief physical description of project

This project provides funds for the design and construction of a new tritium reservoir loading facility at the Savannah River Plant, Aiken, South Carolina.

The new tritium reservoir loading facility will be a maximum resistance, reinforced concrete structure, located adjacent to the existing tritium area buildings. The new structure will be approximately 200 feet long, 175 feet wide, and 23 feet high. An attached standard construction structure will house noncritical support facilities such as change rooms, storage areas, and noncritical support equipment.

The new tritium facility will be designed and constructed in compliance with Department of Energy (DOE) Order 6430.1. The facility will be designed around modular process units using digital control systems for automated procedural actions. The intent of the design in the loading area will be to incorporate designed features for future expansion and renovation. All projected capabilities and capacities will be allowed for in the design. However, only those capabilities and capacities currently scheduled will be installed. State-of-the-art security, accountability, and physical protection designs will be

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tritium loading facility replacement, Savannah River Plant, Aiken, South Carolina 2. Project No.: 86-D-130

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8. Brief physical description of project (contd.)

incorporated in the new tritium facility. Advanced tritium confinement systems will be installed as an integral part of the process such that essentially no tritium will escape to the environment during normal operation of this facility. Critical support systems such as ventilation, fire protection, and electrical systems will be designed in compliance with the objectives stated above. Where necessary, special safety features and the quality assurance program will be employed to ensure that critical systems are designed, constructed, and installed in accordance with the prescribed criteria. The conceptual design for this project has produced a comprehensive description of all new process systems to be installed and a building layout necessary to accommodate these systems. The requested FY 1987 funding will be used for process design, equipment procurement, and construction.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to replace poor and inadequate tritium reservoir loading facilities with a safer, more secure building, "state-of-the-art" equipment, and new process technology needed to support the weapon production schedule in FY 1990 and beyond.

Tritium, a radioactive isotope of hydrogen, is created, purified, and loaded in shipping containers called reservoirs through various facilities at the Savannah River Plant. The existing tritium reservoir loading facility was built in the late 1950's to support a then small, but important part, of the nation's nuclear weapons defense. Over the past 20 years, the nature and volume of tritium reservoir loadings have changed. The once small, essentially laboratory sized, reservoir loading process was retrofitted, expanded, and enhanced into the present day operation. These expansions, revisions, and added features maintained the tritium reservoir loading facility current with military support applications while requiring minimum capital expenditures for each new product.

By the end of this decade, available resources to support the projected quantity and type of unique tritium reservoirs will be expended. Thus, the continuing need to load new unique reservoirs, and the heightened awareness for prompt reprocessing of current use reservoirs, will be beyond the capacity of the existing facility. This project is required to meet scheduled DOE requirements in FY 1990 and beyond and to incorporate advanced "state-of-the-art" tritium loading technology in the new structure.

This project is justified on the basis of required tritium reservoir production capacity and the incorporation of new technology. Work must begin in FY 1986 to assure meeting nuclear weapon production goals through the end of the century.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tritium loading facility replacement, Savannah River Plant, Aiken, South Carolina

2. Project No.: 86-D-130

9. Purpose, justification of need for, and scope of project (contd.)

Capacity

The existing tritium loading facility is not capable of supporting another expansion. Physical limitations and the already extended condition of process support equipment prevents expansion. It is not cost effective or practical to build a separate small tritium loading facility to support future capacity need. The existing tritium reservoir loading facilities are beyond practical rejuvenation because of the aged condition of the whole process and its support equipment. It is not practicable or economical to renovate or retrofit the existing facility and yet meet scheduled production requirements. The complex process and instrument interconnections, which originally made this facility responsive to product and schedule changes, cannot be revised or appended without an extended production outage of several years.

New technology

The new facility will employ recently developed process technology along with engineered systems for physical protection and security. Material control, process control, and nuclear materials accountability will be installed as designed features of the loading process. Significant yearly operating cost savings can be realized by incorporating commercially available designs and equipment that are energy efficient.

Recent DOE-directed programs have developed metal hydride storage, pumping, compression, and separation of hydrogen isotopes to the point where that technology is considered standard. Developments in other areas such as instrumentation, piping connections, personnel protection, and digital control systems now make significant reductions in the size and quantity of process equipment possible. As a benefit, improved containment and virtual elimination of atmospheric releases from the operation will result. These available concepts and systems will be incorporated in the new loading facility. The facilities provided by this project will continue Savannah River Plant's goal of meeting all DOE objectives in a cost-effective manner while minimizing the exposure to operating personnel and releases to the environment.

The combined effect of new equipment and new technology will allow a 25 percent reassignment of the current reservoir loading manpower requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tritium loading facility replacement, Savannah River Plant, Aiken, South Carolina

2. Project No.: 86-D-130

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 22 percent of construction costs, item b		$ 20,000
b. Construction costs		88,870
(1) Buildings	$ 8,719	
(2) Special facilities	37,970	
(3) Electrical	12,003	
(4) Instrumentation including computer control equipment	30,178	
c. Removal costs		130
Subtotal		109,000
d. Contingency at approximately 10 percent of above costs		11,000
Total estimated cost		$120,000

11. Method of performance

The operating contractor, E.I. du Pont de Nemours and Company, will perform design and engineering. The operating contractor will accomplish construction and procurement, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tritium loading facility replacement, Savannah River Plant, Aiken, South Carolina

2. Project No.: 86-D-130

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	$ 4,700	$29,000	$45,000	$26,000	$15,300	$120,000
Total facility costs	$ 4,700	$29,000	$45,000	$26,000	$15,300	$120,000
2. Other project funding						
(a) Conceptual design costs	$ 250	$ 0	$ 0	$ 0	$ 0	$ 250
(b) Other project related costs	2,400	1,000	1,000	1,200	0	5,600
Total other project funding	$ 2,650	1,000	1,000	1,200	$ 0	5,850
Total project funding (items 1 and 2)	$ 7,350	$30,000	$46,000	$27,200	$15,300	$125,850

b. Other related funding requirements (estimated life of project: 25 years)

1. Facility operating costs	$ 4,000
2. Programmatic operating expenses directly related to the facility	38,850
Total other related costs	$ 42,850

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Total facility costs
      The construction line item will provide a complete facility.

   2. Other project costs
      (a) Conceptual design for this project was prepared by the operating contractor at a cost of $250,000.

      (b) Other project-related costs include construction liaison, safety analysis report preparation, startup, procedure development, and initial facility certification.

b. Other related annual costs
   1. Facility operating costs
      Approximately $4,000,000 per year will be required to cover the cost of utilities, maintenance, janitorial services, and related overhead costs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tritium loading facility replacement,
Savannah River Plant, Aiken, South Carolina

2. Project No.: 86-D-130

13. Narrative explanation of total project funding and other related funding requirements (contd.)

2. Programmatic operating expenses directly related to the facility
The average annual incremental cost of direct labor, procurements, and overhead is estimated at $38,850,000 per year.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Enriched uranium recovery improvements, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

3. Date A-E work initiated: 2nd Qtr. FY 1985

3a. Date physical construction starts: 1st Qtr. FY 1986

4. Date construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: $52,000
Date: 1/85

6. Current cost estimate: $52,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 4,500	$ 4,500	$ 4,500	$ 3,537
1986	15,300	13,300	13,300	9,800
1986 Sequestered	(0)	(800)	(800)	(0)
1987	19,800	21,800	21,800	13,700
1988	12,400	13,200	13,200	17,200
1989	0	0	0	7,763

8. Brief physical description of project

This project will upgrade significant facets of the weapons program enriched uranium recovery facility, including process reliability, nuclear criticality safety, production capacity, special nuclear materials (SNM) safeguards, and uranium containment. Production scrap processing equipment will be provided to receive uranium-bearing waste from various sources throughout the plant, sort the material according to type, and then shred and compact the combustibles.

A two-story building addition of approximately 1,500 square feet will be built and a two-stage incinerator will be installed, complete with off-gas cleanup and ash removal accessories, to burn combustible contaminated waste. A series of new high-capacity leaching columns and tray dissolvers will leach uranium from the ash and other contaminated solids. A new secondary uranium processing operation will also be provided to recover virtually all residual uranium in the solids after the primary treatment is complete. New vertical storage tanks and accountability tanks will be provided to enhance uranium processing and accountability. Clarification and purification equipment such as high speed centrifuges will be added to the

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee
2. Project No.: 85-D-112

8. Brief physical description of project (contd.)

main uranium flow line to allow control and removal of solids and organics that currently interfere with purification operations. This equipment will require an addition of a 3,500-square-foot penthouse to the existing building to provide head room for installation of the vertical tanks. A central data acquisition computer room of approximately 1,125 square feet and two local control rooms of approximately 2,000 square feet total including modifications of approximately 1,700 square feet of existing space will be provided.

Major ventilation and humidity control equipment, including air dehumidifiers, fans, ducts, and exhaust stacks, as well as physical isolation of particularly "contaminated" processes, will be provided to reduce the amount of airborne and surface uranium activity. The expanded use of glove boxes and hoods will be emphasized. Also, applicable facility additions and modifications will be provided for the control of environmental effects associated with enriched uranium recovery operations.

A new contamination control facility of 1,125 square feet new area and about 2,500 square feet of existing area will be provided to control uranium "trackout" from the operating area. This facility will feature physically distinct and well-defined clean/contaminated zones with a contaminated shoe park, shoe scuff, and laboratory coat storage area; personnel monitors; and hand wash station. A new decontamination facility will be provided to clean equipment removed from the production area for maintenance or disposal. This facility will feature both small and large disassembly and cleaning hoods with monorail cranes and liquid handling ancillaries such as pumps, filters, and storage tanks. A new computer will be housed in a control facility of approximately 300 square feet.

Major renovations will be made to existing uranium recovery and purification operations by the addition of microprocessor based instrumentation and controls and by modification of equipment and associated peripherals. Existing electrical services will be upgraded to meet the increased process workloads.

The requested FY 1987 funding will be used for engineering design and inspection, for procurement of equipment, and for installation of process facilities.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to upgrade existing enriched uranium recovery facilities to the level necessary to provide for continued reliable and safe operations, for protection of personnel and the environment, and for compliance with standards covering control and accountability of SNM. The existing facility was built more than 25 years ago using then state-of-the-art technology. Now, most of the technology and equipment is old. Significant improvements are essential for safety in operations and for expected future production requirements. This project will provide significant improvements in the areas of: (1) production reliability and maintenance of capacity; (2) criticality safety; (3) nuclear materials control accountability and safeguards; and (4) personnel and environmental protection.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

9. Purpose, justification of need for, and scope of project (contd.)

Function of enriched uranium recovery facilities

The Y-12 Plant is the primary source of highly enriched uranium (93 percent U-235) nuclear weapons components and subassemblies for the nuclear weapons stockpile of the United States. The enriched uranium for new production comes from the disassembly of obsolete weapons. Rough metal forms are first produced in a casting operation using graphite crucibles. Some of the cast metal is then rolled and hot formed. The resulting parts are ultimately machined to final dimensions. The manufacturing process produces a considerable quantity of uranium scrap as casting dross, metal turnings, contaminated graphite, and various contaminated residues. Impure uranium contained in this scrap is recovered in a unique chemical reprocessing facility for reintroduction into the weapons component production stream.

The facility to be improved represents the only enriched uranium recovery capability of any size in the United States. Since there is currently no operational capability for converting material withdrawn from the gaseous diffusion plants to weapons grade metal, this recovery facility represents the only source of makeup material for new nuclear warheads. Furthermore, since impurities are stripped from the scrap uranium during chemical reprocessing, this recovery facility also serves to maintain the minimum overall purity and neutronic characteristics of the weapons uranium stockpile. The highly enriched uranium that is recovered from the production scrap every year is worth hundreds of millions of dollars. Thus, it is essential that the reliability of the Y-12 chemical recovery operation be maintained since economics and material availability and purity requirements demand that the uranium scrap generated during the production operations be reprocessed.

Reliability of operations and maintenance of capacity

The current chemical recovery facility was designed on the basis of technical and administrative standards and practices which were in effect over 25 years ago. The original process and equipment were well chosen and engineered at that time using what was then state-of-the-art technology. Most of the equipment in the facility today is the original equipment. It has seen very few alterations and technological improvements in the intervening years. The chemicals used in the various recovery processes are highly corrosive and, as a result, much of the equipment requires excessive maintenance. The use of automatic control instrumentation is very limited and the instruments used represent obsolete technology. Thus, the recovery facility is reaching the end of its useful life and its ability to meet anticipated production requirements during the 1980's and beyond must be considered marginal.

In addition to the need for improving production reliability, significant improvements are necessary to insure that this facility can be operated under adequate conditions of uranium accountability, environmental and personnel protection, and criticality safety.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee
2. Project No.: 85-D-112

9. Purpose, justification of need for, and scope of project (contd.)

Criticality safety

The most important concern with the adequacy of the present facilities deals with nuclear safety. In view of the severe consequences of an uncontrolled nuclear reaction, nuclear criticality safety is a major concern in all enriched uranium operations and, in particular, those involving large quantities of uranium bearing solutions. Strict administrative controls are one of the major tools used at Y-12 to assure nuclear criticality safety. As the equipment continues to age and deteriorate, the number of incidents requiring actions by process operators will increase. Also, undetected leaks or other problems which could result in a criticality incident are more likely to occur. Upgrading of current facilities is necessary to increase the integrity of pipes and processing equipment, replace batch processing with continuous processing, increase the use of geometrically safe equipment, add process control and monitoring instrumentation, and reduce the need for opening of storage tanks for cleaning. All of these upgrading actions will serve to reduce reliance on administrative control and significantly reduce the risk of incurring a criticality incident.

Nuclear materials control accountability

Current equipment configurations, instrumentation, and some elements of process capability are inadequate to measure the enriched uranium inventory to the degree of precision required by current accountability and safeguards criteria. Significant uncertainties in inventory are inherent due to the fact that uranium solutions are stored in a number of small diameter horizontal tanks whose level cannot be accurately determined and it is very difficult to obtain a representative sample. A small error in determining the level of solution in storage tanks or a nonrepresentative sample results in a sizeable inventory difference.

Another area of uncertainty and delay in accounting for enriched uranium on a monthly basis is in determining the uranium content of various types of residues. Facilities improvements are required to provide additional capability for processing residues to a measurable form in a timely manner, thereby minimizing the backlog of residues.

As the equipment continues to age and deteriorate, there is an increasing potential for major losses of enriched uranium due to leaks and other problems with current equipment and technology.

Personnel and environmental protection

Continued operation of existing facilities is of major concern from the standpoint of protection of personnel and the environment. While current standards are being met, personnel exposures and effluent releases have in some cases been at higher-than-desired levels and generally show upward trends. This is due in part to increased production throughput, but the major cause is the age and condition of the equipment and the need for more and more maintenance which greatly increases personnel exposures and the potential for uranium releases.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

9. Purpose, justification of need for, and scope of project (contd.)

Deficiencies in ventilation systems, decontamination facilities, and process equipment are such that the facility as a whole does not provide an adequate margin of safety necessary to maintain a good health physics environment. With continued deterioration of the equipment, there is a possibility in the future that it will not be possible to meet personnel and environmental protection standards through the use of operating controls and limitations. More stringent standards are highly likely in the near future which will further increase the difficulty of compliance.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 21 percent of construction costs, item b ...		$ 7,500
b. Construction costs		35,600
(1) Building additions	$ 2,100	
(2) Special process facilities for uranium recovery processes	33,500	
Subtotal		43,100
c. Contingency at approximately 20 percent of above costs		8,900
Total estimated cost		$52,000

11. Method of performance

To the extent feasible, design will be accomplished on the basis of a negotiated architect-engineer contract. Inspection will be performed by the operating contractor. Construction, installation, and procurement will be accomplished by the cost-plus-award-fee contractor and the operating contractor.

Project implementation must be structured to ensure continuity of existing production operations; maintenance of the SNM safeguards and accountability capability; and the preservation of criticality, personnel, and environmental safety.

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a/ Estimate is based on a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$13,337	$13,700	$17,200	$ 7,763	$52,000
Total facility costs	13,337	13,700	17,200	7,763	52,000
2. Other project funding					
(a) Conceptual design	2,085	0	0	0	2,085
(b) Process development effort	4,865	0	0	0	4,865
Total other project funding	6,950	0	0	0	6,950
Total project funding (items 1 and 2)	$20,287	$13,700	$17,200	$ 7,763	$58,950

b. Other related funding requirements (estimated life of project: 20 years)	
1. Facility operating costs	$ 1,300
2. Programmatic operating expenses directly related to the facility	3,050
Total other related annual funding requirements	$ 4,350

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other related project funding

(a) Conceptual design for this project has been completed in two stages. The initial conceptual design cost $663,000. Subsequent pre-title I activity intended to reduce cost uncertainties and improve the completion schedule was completed at a cost of $1,422,000.

(b) Process development effort necessary to establish the parameters and criteria for design of this project was completed prior to FY 1987 by the operating contractor at a cost of $4,865,000. The work includes investigation of an alternative residue treatment process and extraction column controls. This development effort, having been completed, will not constrain the construction of this project. Attractive, alternative technologies have been identified in several cases which offer the potential for large incremental performance gains over the base design. The unique application of these processes and systems to uranium recovery involve technical uncertainties which will be assessed prior to start of project design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

1. Facility operating costs

Annual facility operating costs include utilities, maintenance, janitorial services, and related overhead.

2. Programmatic operating expenses directly related to the facility

Operating expenses directly related to the new facility will cover direct labor, material, supplies, and related overhead.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Power plant and steam distribution system, Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

3. Date A-E work initiated: 3rd Qtr. FY 1981

3a. Date physical construction starts: 4th Qtr. FY 1985

4. Date construction ends: 2nd Qtr. FY 1991

5. Previous cost estimate: $30,400
Less Design Funding: 2,000 a/
$28,400
Date: 1/85

6. Current cost estimate: $29,200
Less Design Funding: 2,000 a/
$27,200
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 4,500	$ 4,500	$ 4,500	$ 60
1986	18,500	13,500	13,500	5,640
1986 Sequestered	(0)	(810)	(810)	(0)
1987	2,600	7,600	7,600	5,200
1988	0	810	810	10,300
1989	0	0	0	4,300
1990	1,600	1,600	1,600	1,000
1991	0	0	0	700

8. Brief physical description of project

This project provides for the construction of a new central power plant equipped for the cogeneration of electric power, a new steam distribution and condensate return system, and demolition and disposal of the existing steam plant and distribution system.

The new power plant will be designed for natural gas as the primary fuel and will provide for conversion to coal at a later date as conditions warrant. Current availability of natural gas in the Amarillo area and overall life cycle cost evaluation

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a/ A significant part of the design for this project was completed using FY 1981 and FY 1982 funding provided by the Department of Energy (DOE) In-House Energy Management Program.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system,
Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

8. Brief physical description of project (contd.)

strongly favors natural gas as the primary fuel. A 600,000-gallon supply of reserve fuel oil is presently available at Pantex for emergency boiler fuel. Two of the boilers will be designed to accommodate later conversion to coal use, but no equipment for firing coal is included in this project. The same two boilers will be designed for high pressure steam for use if it is economical to add congeneration in the future.

The boiler plant will house two high pressure steam boilers, each rated at 50,000 pounds per hour, and two low pressure boilers, each rated at 25,000 pounds per hour. The high pressure boilers will be designed to accept a superheater assembly in the future if a congeneration system is found to be economically feasible. The plant will be centrally located between major heating and cooling loads on the site. The power plant building will be approximately 82 feet by 162 feet by 60 feet high, with four stacks. The building will be a steel frame structure with insulated metal panels.

A new steam distribution and condensate return system using 400°F steam will be built. A portion of the new steam distribution system will be installed in 6,800 feet of new concrete trench at ground surface level. Approximately 43,000 feet of insulated steam pipe will be installed with necessary overhead supports, manholes, valves, and building connections.

Provisions will be made for demineralizing and treating water from an existing well. A condensate storage tank will be built. The existing sanitary sewer will be extended to the power plant site.

Design of this project was begun and substantial progress made using FY 1981 and FY 1982 funds provided by the DOE In-House Energy Management Program. Design of the steam distribution system has been completed. Design of the power plant, Title II, engineering, will be completed in April, FY 1987. Due to the excessive asbestos currently in place in the old power house, some architect-engineer (AE) effort will be associated with this extensive demolition work. Such items as surveys, drawings, and photographs will be required in order to safely demolish the old powerhouse. This AE effort is scheduled for completion in FY 1989. Construction of the power plant is scheduled for completion, check-out, and start-up in the first quarter of FY 1990, with demolition and disposal of existing steam plant and distribution system to be completed in the second quarter of FY 1991. The requested FY 1987 funding will be used to complete major procurements and construction.

9. Purpose, justification of need for, and scope of project

Reliability is the primary and overriding factor which justifies immediate funding for this project. Pantex weapon production requires steam for continued operation; failure of the steam plant or distribution system could shut down production activities important to national security for as much as six months. Design of the project is in progress. The requested funding will permit completion of a reliable system late in 1990.

The existing Pantex steam plant and steam distribution systems are overaged, inefficient, and of seriously questionable reliability. The boiler plant, built in the 1940's under wartime limitations, has long exceeded the 25-year expected service

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system, Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

9. Purpose, justification of need for, and scope of project (contd.)

life. Replacement parts are often not available and require custom manufacturing with lead times of several months. Failure of this plant could result in a shutdown of Pantex weapon production activities that could last several months. Over 50 percent of the steam energy produced in the boilers is lost due to inefficiencies and condensate losses in the steam distribution system.

The inefficiency in the steam distribution system is the result of a gradual shift in the technique for manufacturing of high explosive (HE) components for nuclear weapons changing from melting and casting the required shapes to precision machining. In early years, most of the HE parts were formed by casting after the HE had been melted by exposure to steam. The large amounts of steam needed were transmitted in 18-inch pipelines. Condensate from this operation was, in most cases, not suitable for reuse because of HE contamination. Condensate return lines were not provided from areas where the quality of the condensate was questionable.

With progress in weapon design and production technology, HE component fabrication gradually evolved from molten casting to precision machining of the explosive shapes needed in newer weapons. The use of steam in the production areas has now decreased substantially, in some areas to about 10 percent of the 18-inch line capacity, with consequent very slow flow of steam in the lines. An engineering analysis of the energy losses in the existing steam distribution system shows a majority of the steam energy produced in the boilers is lost in transmission. Several factors are involved including oversized steam lines, deteriorated insulation, condensate losses, and undetected steam leaks. Considering the relatively low cost of fuel ten years ago, replacement of the steam plant and distribution system would have shown a rather unattractive payout. Dramatic increases in fuel costs over the past few years now show that elimination of this energy loss can be justified on economics alone. Projected fuel costs show that future energy losses using the existing steam distribution system would be several million dollars per year. This project, providing a new high-pressure steam plant and a new steam distribution system, is economically justified. A life-cycle cost analysis shows a 11.8-year payback and a savings-to-investment ratio of 1.768 using a projected 25-year service life. It should be noted that the steam plant reliability will greatly increase in addition to the economic justification.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system, Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 8 percent of construction costs, item b		$ 1,680 b/
b. Construction costs		20,330
(1) Improvements to land	$ 400	
(2) Buildings, including boiler house	7,930	
(3) Special facilities, including boiler and auxiliary equipment	5,050	
(4) Utilities, including steam distribution system	6,950	
c. Removal cost less salvage (existing power plant and steam lines)		2,350
Subtotal		24,360
d. Contingency at 12 percent of above costs		2,840
Total estimated cost		$27,200

11. Method of performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction will be accomplished by a fixed-price contract awarded on the basis of competitive bids. Procurement support and relocation of existing equipment will be performed by the operating contractor.

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a/ Based upon essentially completed design of steam distribution system and partially completed design of steam plant.

b/ Excludes $2,000,000 provided by Department of Energy In-House Energy Management Program in prior years for pre-Title I studies and partial design of this project.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system, Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	Total
a. Total project funding							
1. Total facility costs							
(a) Construction line item	$ 5,700	$ 5,200	$10,300	$ 4,300	$ 1,000	$ 700	$27,200
(b) Partial design	2,000	0	0	0	0	0	2,000
Total facility costs	7,700	5,200	10,300	4,300	1,000	700	29,200
2. Other project funding							
(a) Conceptual design costs	35	0	0	0	0	0	35
Total other project funding	35	0	0	0	0	0	35
Total project funding (items 1 and 2)	$ 7,735	$ 5,200	$10,300	$ 4,300	$ 1,000	$ 700	$29,235
b. Other related funding requirements (estimated life of project: 25 years)							
1. Facility operating costs							$ 5,305
Total other related costs							$ 5,305

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
Conceptual design for this project was prepared by the operating contractor at a cost of $35,000.

b. Other related funding requirements
It is estimated that the programmatic life of this project is 25 years.

1. Facility operating costs

Facility operating costs of $5,305,000 annually includes the cost of operating labor, equipment maintenance, supplies, and fuel. The approximate fuel cost is $4,253,000 per year.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Renovate plutonium building utility systems, Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

3. Date A-E work initiated: 2nd Qtr. FY 1985

3a. Date physical construction starts: 4th Qtr. FY 1985

4. Date construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: $35,600
Date: 1/85

6. Current cost estimate: $35,100
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 2,900	$ 2,900	$ 2,900	$ 66
1986	17,700	17,700	17,700	9,000
1986 Sequestered	(0)	(1,060)	(1,060)	(0)
1987	14,500	14,500	14,500	14,800
1988	0	1,060	1,060	8,500
1989	0	0	0	2,734

8. Brief physical description of project

This project will renovate or replace extensively deteriorated and obsolete utility equipment in the original plutonium processing complex which consists of three buildings--the Plutonium Recovery Facility, Building 771; the Nuclear Waste Packaging Facility, Building 771-C; and the Waste Treatment Plant, Building 774.

In the Plutonium Recovery Facility, modifications will be made to the contaminated ventilation system including addition of fans, motors, controls, fire alarms, fire suppression systems, and replacement of existing air handling equipment. The main exhaust plenum will be renovated. A stainless steel liner will be installed inside the existing concrete plenum chamber. The stainless steel plenum will be partitioned into three separate sections fitted to a common manifold. Each section will have air-handling capacity of approximately 125,000 cubic feet per minute. Two existing airlocks will be modified and a new central airlock added. Breathing air stations and communications equipment will be provided for each airlock. The first stage filter frames will be replaced. Existing pipe chases will be isolated from the plenum interior by stainless steel sheet metal enclosures. Air flow measurement equipment and inlet environmental monitoring instrumentation will be installed to measure moisture content, hydrogen fluoride, and nitrous oxide gases. Fire protection conduit and piping and lighting will be

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems, Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

8. Brief physical description of project (contd.)

relocated. Five main exhaust fan motors and controls will be replaced. The existing exhaust tunnel and stack will be replaced. The main trunk exhaust duct will be replaced. Parts of the existing room and glove box exhaust air duct system will be replaced. The modifications to be completed on the Plutonium Recovery Building will include replacing two substation transformers, increasing the capacity of the existing uninterruptible power supply, and replacing control systems on the exit heating, ventilating, and air-conditioning (HVAC) system. A new HVAC manifolded supply system will be installed. The compressed air system, steam distribution system, cooling water system, and sanitary and process drain vent filters will be modified.

In the Nuclear Waste Packaging Facility, the existing air supply and exhaust systems will be renovated. An additional filter stage will be installed. New heat coils will be installed in the air supply system and air conditioning will be provided.

In the Waste Treatment Plant, heating coils in the existing air supply system will be replaced and controls on the air exhaust system will be replaced.

The requested FY 1987 funding will be used to complete this project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to modify existing utility systems within the three-building plutonium processing complex to achieve a safe, dependable operating condition necessary to support continued use of these buildings in the future. The decision to upgrade these buildings is based on the Rocky Flats Long-Range Study which shows that the buildings are structurally adequate and can be renovated more economically than constructing new facilities.

An in-depth review of the current and projected use for the complex indicates that these facilities must continue in operation to support future workload projections. The facilities are approximately 30 years old, extensively deteriorated, and have been damaged by continuous service under corrosive conditions. Current projections show that the old Plutonium Recovery Facility will need to remain totally operational until about 1998 to handle processing not scheduled for transfer to the new Plutonium Waste Recovery Facility.

The main exhaust plenum in the Plutonium Recovery Facility has been subjected to highly corrosive acid fumes for 30 years and to a fire in 1957 which extensively damaged the first stage filter frames. Concrete subjected to acid fumes has lost its strength and has begun to crumble. The first stage filter frames were badly warped in the 1957 fire and, although repaired, are of inferior quality. Leaks in pipe chase liners could provide a direct bypass of both filter stages. While no leaks are known to exist, the liners are extensively corroded. Plutonium emissions, although well within safety limits, have shown an upward trend over recent years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems, Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

9. Purpose, justification of need for, and scope of project (contd.)

There is a significant potential risk of failure in the extensively deteriorated building utility systems in the three-building plutonium processing complex at Rocky Flats. There is concern that the increased throughput that will be necessary may result in a breakdown of these old ventilation systems and the potential release of plutonium contamination inside and possibly outside the facilities. The concerns are based upon frequency of repairs to these facilities which have been subjected to highly corrosive acid fumes. Current monitoring of exhaust air from this complex is showing an increasing frequency of radioactive "spikes" associated with minimal disturbances of the system during maintenance and repair. These emissions currently remain within acceptable safety limits. However, a significant disturbance could potentially present the Rocky Flats Plant with a plutonium release which could interrupt nuclear weapon production for several months. The operators of these facilities judge that a one-year delay in completing this project would substantially increase the potential for radioactivity releases.

An in-depth review of the current and future need for this plutonium processing complex has been made by the Department of Energy (DOE). All present research and development operations will remain in this three-building complex. The need for processing and recovery of special plutonium residues to support the weapon design laboratories will continue to exist after all recovery operations are transferred to the new facility. Based on the projected weapons production workload, it is expected that this complex will remain fully operational for plutonium recovery for at least 10 years after completion of this project.

This project would correct all known deficiencies in the utility systems. An additional stage of filtration will be added to meet health, safety, and environmental requirements. Significant improvements in operations and maintenance are expected as a result of this project.

The total estimated cost of this project has been reduced by $500,000 as a result of reduced escalation rates and reduced labor requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems, Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 15 percent of construction costs, item b		$ 3,300
b. Construction costs		22,100
(1) Removal of existing equipment	$ 4,800	
(2) Procurement and installation of new equipment	17,300	
c. Standard equipment		3,800
Subtotal		29,200
d. Contingency at 19 percent of above costs		5,900 b/
Total estimated cost		$35,100

11. Method of performance

Design will be performed under a negotiated architect-engineer contract. Construction will be performed by an onsite contractor under an existing cost-plus-fixed-fee contract. Inspection of construction and procurement will be performed by the operating contractor.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$ 9,066	$14,800	$ 8,500	$ 2,734	$35,100
Total facility costs	9,066	14,800	8,500	2,734	35,100
2. Other project funding					
(a) Conceptual design costs	90	0	0	0	90
(b) Radiation monitoring	200	300	300	200	1,000
Total other project funding	290	300	300	200	1,090
Total project funding (items 1 and 2)	$ 9,356	$ 15,100	$ 8,800	$ 2,934	$36,190

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a/ Based upon completed conceptual design.

b/ Contingency applies to work to be performed during FY 1986, FY 1987, FY 1988, and FY 1989. A relatively high contingency is required to cover unanticipated costs associated with unknown contamination in the existing process facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems, Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

12. Funding schedule of project funding and other related funding requirements

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	$ 2,800
2. Programmatic operating expenses directly related to the facility	0
Total other related costs	$ 2,800

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design costs

The conceptual design for this project was prepared by the operating contractor at a cost of $90,000.

(b) Radiation monitoring

The operating contractor will provide the necessary manpower equipment and material during construction to perform all radiation safety monitoring, to perform the necessary decontamination as the work progresses, and to prepare required safety analysis reports after construction is completed. The total estimated cost of this work is estimated to be $1,000,000.

b. Other related funding requirements

The estimated useful life of this project is 20 years.

1. Facility operating costs

The projected facility operating costs for the proposed construction is $2,800,000 per year. This includes maintenance, labor, materials and supplies, plus janitorial and utility services.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Air and water pollution control facilities, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

3. Date A-E work initiated: 1st Qtr. FY 1985

3a. Date physical construction starts: 4th Qtr. FY 1985

4. Date construction ends: 4th Qtr. FY 1988

5. Previous cost estimate: $29,000
Date: 1/85

6. Current cost estimate: $29,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 5,000	$ 5,000	$ 5,000	$ 531
1986	14,000	14,000	14,000	10,500
1986 Sequestered	(0)	(840)	(840)	(0)
1987	10,000	10,000	10,000	11,600
1988	0	840	840	6,369

8. Brief physical description of project

This project will provide facilities required for the reduction of mercury in Y-12 Plant liquid effluents and for the modification of existing facilities to control particulate emissions. This project consists of two subprojects. One will isolate building sites from which mercury contamination issues and will provide facilities for treatment of all effluents and rainfall runoff from those sites. The second subproject will modify existing enriched and depleted uranium process exhaust systems to reduce the discharge of hazardous particulates to the environment.

Reduction of Mercury in Y-12 Liquid Effluents

Parts of the Y-12 Plant are moderately contaminated with mercury as a result of past large-scale operation of a mercury-based isotope separation system. Rain water and any process water coming into contact with the contaminated buildings, equipment, or soil surrounding the old mercury process facilities generally becomes contaminated with environmentally unacceptable levels of mercury. This project will provide for installation of water treatment facilities for reducing the mercury concentration in water being discharged from the Y-12 Plant to the East Fork Poplar Creek. Construction will include isolation of mercury-contaminated building sites to control all discharges from the site.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

8. Brief physical description of project (contd.)

Mercury contaminated water originating in the process building will be piped to new or existing collection sumps. New 3,000-gallon holding tanks, transfer pumps, and the necessary piping will be installed to form a surge control holding system. Ion exchange treatment facilities will be built to remove selectively mercury from the contaminated water. Within the mercury contaminated buildings, piping modifications will be made to collect uncontaminated cooling water from compressors, vacuum pumps, and heating ventilation and air conditioning units. New drain lines will be installed to discharge the uncontaminated water into appropriate storm sewer lines.

To isolate the contaminated buildings and surrounding areas from the storm drainage system will involve replacement, rerouting, and restoring components of the existing storm drainage system. Existing main storm sewer lines discharging to East Fork Poplar Creek pass through the mercury contaminated area. Sections of these main storm sewers are contaminated with mercury and, due to deterioration of the reinforced concrete pipe and joints associated with age, contaminated subsurface water enters the system and contributes mercury pollution to the creek. Sections of the storm sewer main lines will be replaced to eliminate infiltration of contaminated subsurface water. Existing mains in the mercury contaminated areas to be abandoned in place include sections of 36-inch, 48-inch, and 60-inch reinforced concrete pipe. The abandoned sections will be filled with concrete grout and/or other suitable material. Existing lateral storm sewer lines will be disconnected from the existing sewer mains and connected to the new mains. Lateral sewer lines to remain in service will be restored by installing an impermeable, corrosion resistant lining inside the existing lines. The lining process will be applied to lateral sewer lines 24 inches in diameter and smaller. All mercury contaminated material excavated during installation and removal of piping systems will be fixed in concrete and disposed of in an approved landfill.

Other remedial construction will include installing new asphalt concrete pavement and repairing and sealing existing paved areas to provide a relatively impermeable surface over mercury contaminated soils. This will decrease infiltration of surface water to the contaminated subsurface zone.

Reduction of Uranium in Process Stack Emissions

The stack emissions control project will refurbish and upgrade the environmental control systems for uranium process exhaust that are currently contributing a significant dose burden to individuals living at the plant boundary. Existing equipment deficiencies will be corrected and new equipment installed on certain exhausts that are not currently treated.

In one major process building, two new fume scrubbers will be installed to process offgas from beaker leaching operations. Each system will consist of a venturi scrubber, 150-gallon tank, recirculation pumps, filter, and circulant cooler. The offgas from the scrubber will be passed through a demister and steam heater prior to an High Energy Particle Air (HEPA) filter and discharged to the atmosphere. The exhaust from an existing extraction vent caustic scrubber will be heated and equipped

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

8. Brief physical description of project (contd.)

with a HEPA filter. Unfiltered exhaust systems will be equipped with a HEPA filter. A number of exhaust systems will be combined and routed to a central exhaust stack.

Modifications and additions will be made on a second major process building exhaust system. An existing exhaust system will be rebuilt to include a bag house and HEPA filter bank. Part of the system will be rerouted and existing exhaust stacks on two building wings will be converted to new exhaust systems. Construction will include an enclosure for the baghouse and HEPA filters, a central exhaust stack, and exhaust fans.

Four new high capacity annular scrubbers will be installed to process the exhaust from wet chemical operations. The scrubbers will remove nitric acid fumes and entrained nitric acid solution from vent gases to permit the use of HEPA filters on the exhaust. Part of the building roof will be structurally upgraded to support the scrubber systems and to accommodate installation of new exhaust fans, HEPA filters, and a central exhaust stack. The exhaust from the existing chloride removal systems will be rerouted through separate duct work to the new stack.

The exhaust system from special processing operations will be rerouted to a new central prefilter and HEPA filter bank. New exhaust fans and a central exhaust stack will be provided. A fume scrubber will be provided for the exhaust from the uranium recovery acid pickling process. The system will consist of a venturi scrubber, 150-gallon tank, recirculation pumps, filters, and a circulant cooler. The exhaust from the scrubber will be heated and ducted to a HEPA filter. A small building addition will be built to house the special environmental control systems.

Other existing unfiltered process exhaust systems will be rebuilt and otherwise modified so that higher removal efficiencies can be achieved.

Support facilities to be provided include a new 13,800 volt/2,400 volt substation to supply power to new exhaust fans and pumps. New motor control centers, power feeders, and distribution panels will be installed. A 10,000-gallon waste collection tank will be installed to store spent scrub solution. The tank will be contained in a 20-foot by 20-foot by 4-foot high concrete retainment structure. Recirculation, transfer, and sump pumps will be provided. Temporary storage facilities will be provided to hold used uranium-contaminated HEPA filters. Instruments will be installed in process exhaust stacks to measure radionuclide discharges to the atmosphere. To obtain weather data needed to calculate dose equivalent rate to the public, two 60-meter meteorological towers will be installed and equipped to measure and record wind speed and direction, temperature, and dew point.

The requested FY 1987 funding will be used for procurement of equipment, rerouting and replacement of storm sewers, paving to prevent seepage of contaminated ground water, and for completion of procurement and construction of stack emission control facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

9. Purpose, justification of need for, and scope of project

The Y-12 Plant has been cited recently for noncompliance in several environmental areas by both the State of Tennessee Department of Health and Environment (TDHE) and the U.S. Environmental Protection Agency (EPA).

Past and present disposal practices for liquid wastes are no longer acceptable. Dilute liquid wastes may no longer be discharged directly or indirectly to either the East Fork Poplar Creek, which originates within the plant and runs through the City of Oak Ridge, or to the Bear Creek drainage basin.

Certain past operations have left an environmental legacy of mercury contamination at the plant. Lithium isotope separation processes operated in the late 1950's and early 1960's resulted in extensive losses of mercury within the Y-12 Plant. Residual mercury contained in old process buildings and grounds of the plant resulted in the discharge of this hazardous material to the East Fork Poplar Creek and continuous violation of the Tennessee Stream Guide for mercury. In order to attempt to meet the State guidelines, sources of contamination such as old process buildings, equipment, and soils containing spill residue will be substantially reduced. This project will isolate drainage from old process buildings containing mercury contaminated equipment in order to control release of mercury contamination. Removal of the mercury contaminated building and equipment is being planned for a future construction project which, when submitted, will include consideration of EPA and TDHE guidance.

Subsequent to the notification of noncompliance in these areas, certain environmental objectives were agreed upon by the TDHE, EPA, and the U.S. Department of Energy (DOE) in a Memorandum of Understanding (MOU) dated May 26, 1983. The MOU delineates the actions which constitute preliminary measures toward full environmental compliance, and it has been strongly stated both in the MOU and subsequent meetings among the TDHE, EPA, and DOE that further plans, actions, and remedial programs will be developed. To this end, this project will provide improvements which are necessary to support the current MOU and those that will be required in the near term to meet further compliance agreements between the parties.

Failure to meet these objectives could result in legal action by the State and/or EPA aimed at shutting down certain operations critical to the manufacture of nuclear weapons components at the Y-12 Plant. These weapons production facilities are not duplicated in the nuclear weapons complex. Under current production workload commitments, a shutdown could deal a serious blow to the national defense effort.

Reduction of Mercury in Y-12 Liquid Effluents

The purpose of this subproject is to isolate primary mercury-contaminated areas and to provide source treatment systems to comply with the Clean Water Act. The effluents from ion exchange mercury contamination removal facilities will be released at a permitted National Pollutant Discharge Elimination System (NPDES) discharge point.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

9. Purpose, justification of need for, and scope of project (contd.)

Interactions between the TDHE, EPA, and DOE have identified a need for specific measures to be taken immediately to cease or treat adequately current discharges of mercury contamination into the East Fork Poplar Creek. The sources of unacceptable discharges to the creek are plant waste waters and mercury-contaminated surface drainage originating from identified sites within the Y-12 Plant. Residual mercury in and around buildings formerly used in lithium isotope separation processes provides a continuous source of mercury contamination. In periods of heavy rainfall, the situation is worsened as additional mercury is flushed from sediments lying in storm drain piping.

This project will provide for a significant reduction (estimated at 90 percent) in mercury emissions which is necessary to meet Clean Water Act requirements. However, even with such a reduction in mercury discharge, it is not very certain that the Tennessee stream limit of 0.05 parts-per-billion can be achieved. The proposed effort to achieve compliance will eliminate a substantial amount of mercury pollution and is expected to achieve substantial conformance with the Tennessee requirements. Failure to make a practical attempt at compliance could result in legal action by the State and/or EPA aimed at shutting down certain operations critical to the manufacture of nuclear weapons components at the Y-12 Plant.

Reduction of Uranium in Process Stack Emissions

As a consequence of the operation of various Y-12 Plant facilities, uranium is discharged into the atmosphere in the form of particulates. To limit the amount of uranium emitted, control devices such as scrubbers and HEPA filters have been installed in many process exhaust systems. In FY 1981, the emission control facilities kept the amount of radioactive uranium particulate emissions well below the existing standards. Under the authority of Sections 112 and 122 of the Clean Air Act, the EPA has declared naturally occurring and man-made radioisotopes as hazardous pollutants, and new regulations have effectively reduced the amount of airborne radionuclides that can be released at the Y-12 Plant. The purpose of this subproject is to provide environmental controls to bring the Y-12 Plant into compliance with the requirements and intent of the new standards.

The basic concept employed to achieve this goal will be to install state-of-the-art emission controls on uranium process exhausts that are currently contributing a significant dose burden to individuals living at the plant boundary and to make provisions for their integrity and functionality. Existing equipment deficiencies will be corrected and new equipment added for certain exhausts which are not currently treated. New onsite meteorological data collection capabilities will be installed for satisfactory modeling of radionuclide dispersion to offsite areas. Sampling systems will also be provided to evaluate and demonstrate compliance.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

9. Purpose, justification of need for, and scope of project (contd.)

The scope of the work consists of providing environmental controls for enriched uranium production facilities and necessary support systems such as power distribution networks, waste collection facilities, sampling systems, and weather data collection facilities.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 24 percent of construction costs, Item b...		$ 4,800
b. Construction costs		18,900
(1) Improvements to land including paving, drainage, and storm sewers	$ 7,700	
(2) Building modifications	400	
(3) Special facilities, including air sampling, water treatment, waste disposal facilities, piping, exhaust systems, scrubbers, and filters	9,800	
(4) Utilities, including electrical power distribution	1,000	
Subtotal		23,700
c. Contingency at approximately 22 percent of above costs		5,300
Total estimated cost........		$29,000

11. Method of performance

To the extent feasible, design will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

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a/ This estimate is based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

12. Funding schedule of project funding and other related funding requirements

	FY 1985	FY 1987	FY 1988	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	$11,031	$11,600	$ 6,369	$29,000
Total facility cost	11,031	11,600	6,369	29,000
2. Other project funding				
(a) Conceptual design costs	66	0	0	66
Total other project funding	66	0	0	66
Total project funding (items 1 and 2)	$11,097	$11,600	$ 6,369	$29,066

b. Other related funding requirements (estimated life of project: 15 years)

1. Facility operating costs	$ 550
2. Programmatic operating expenses directly related to the facility	1,280
Total other related annual funding requirements	$ 1,830

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

Conceptual designs for this project have been prepared by the operating contractor at a cost of about $66,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

13. Narrative explanation of total project funding and related funding requirements (contd.)

b. Other related funding requirements

It is estimated that the useful life of this project will be approximately 15 years.

1. Facility operating costs

Facility operating costs estimated at $550,000 per year include the cost of utilities, janitorial services, related material and supplies, plus overhead.

2. Programmatic operating costs

Facility operating expenses of approximately $1,280,000 annually will cover the cost of operating labor, equipment maintenance, supplies, fuel, and overhead.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and site security upgrade, Phase I, Pantex Plant, Amarillo, Texas
2. Project No.: 85-D-123
3. Date A-E work initiated: 1st Qtr. FY 1985
3a. Date physical construction starts: 4th Qtr. FY 1985
4. Date construction ends: 3rd Qtr. FY 1988
5. Previous cost estimate: $5,000
Date: 1/85
6. Current cost estimate: $5,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 1,000	$ 1,000	$ 1,000	$ 74
1986	4,000	3,000	3,000	2,626
1986 Sequestered	(0)	(180)	(180)	(0)
1987	0	1,000	1,000	1,800
1988	0	180	180	500

8. Brief physical description of project

This project provides for a new internal exclusion area and personnel control program to enhance the security posture of the Pantex Plant.

Personnel control facilities include a new internal exclusion area and personnel control facilities for special nuclear materials (SNM) work areas of Zone 12 will be created by the construction of approximately 1.85 miles of 8-foot-high chain link fence and four badge verification stations to control personnel access. Badge verification will be accomplished in guard stations by the addition of electronic badge reader(s), a microcomputer, television monitors, and video disc reader. The badge readers will access a microcomputer located in the administration building.

Each badge verification station (approximately 150 square feet) will be built of concrete masonry with steel joints and metal deck roofs. Each will be strategically located as appendages to existing ramps leading to SNM areas. Each station will have two radiation detectors and traffic control devices such as pipe rails to channel pedestrian traffic and bicycles and gates to control forklift and electric cart traffic. Traffic control devices will be constructed within the existing ramp.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Phase I, Pantex Plant, Amarillo, Texas
2. Project No.: 85-D-123

8. Brief physical description of project (contd.)

The new fencing will be diamond mesh chain link fabric, 8 feet full height with line posts spaced at 10 feet on center and set in concrete. Twelve gates will be required in the fence line to maintain access to the area for maintenance vehicles and fire department vehicles and personnel. A total of approximately 550 linear feet of 12-foot-wide roadway and approximately 1,400 linear feet of 20-foot-wide roadway is required in segments to redirect and allow access for maintenance and emergency vehicles. Lighting for this internal exclusion area will consist of 21 100-foot-high steel light poles.

The badge verification system will display a stored image when the badge reader reads a badge. The images will be permanently stored on video laser discs having a capacity of 15,000 stored images and will display in less than .5 seconds. The microcomputer will be able to store information and the system can keep an accountability and historical record of access for later retrieval as required. The system will have common communication, data, and video loops between all stations, thus allowing shared resources in the event of hardware failure and the utilization of auxiliary badge readers and monitors at specific gates when high traffic is expected during shift change.

The FY 1987 funding (final for this project) will be used to complete construction on fencing and roadway.

9. Purpose, justification of need for, and scope of project

Currently, personnel are checked for admittance two or three times when entering the Pantex Plant. These are: (1) when a vehicle enters an outer plant gate, a visual badge check is done on one badge per vehicle; (2) when entering into Zone 12 or Zone 11; and (3) when entering into Zone 12 South from Zone 12 North.

A badge is verified now by the fact that a person has possession of the type of badge currently being utilized and that the person in possession of the badge is the person whose picture is on the badge. Access to existing subdivided areas is based on "the need to know" concept by access codes on the badges. There is, however, an area of Zone 12 South where SNM operations are conducted that is not presently separated from the balance of Zone 12 South. At the present time, all personnel in the south end of Zone 12 have the opportunity to enter an assembly bay or building conducting SNM operations.

This project would provide for a physical barrier separating the SNM area from Zone 12 South and thus further restrict physical access to the SNM area to only authorized personnel by means of the 8-foot-high chain link fence.

Badge verification for personnel entering this SNM area will be enhanced by the proposed electronic badge reader and video disc system which includes a controlled computer system verification. Upon a request for entry, this person's picture would have to be on file in the controlled video disc system.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Phase I, Pantex Plant, Amarillo, Texas
2. Project No.: 85-D-123

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 25 percent of construction costs, Item b		$ 800
b. Construction costs		3,400
(1) Improvements to land	$ 300	
(2) Buildings	400	
(3) Other structures	100	
(4) Special facilities	2,600	
c. Standard equipment		300
Subtotal		$ 4,500
d. Contingency at approximately 11 percent of above costs		500
Total estimated cost		$ 5,000

11. Method of performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction will be accomplished by fixed-price contracts awarded on the basis of competitive bids.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	$ 2,700	$ 1,800	$ 320	$ 5,000
Total facility cost	2,700	1,800	320	5,000
2. Other project funding				
(a) Conceptual design cost	10	0	0	10
Total other project funding	10	0	0	10
Total project funding (Items 1 and 2)	$ 2,710	$ 1,800	$ 320	$ 5,010
b. Other related funding requirements (estimated life of project: 25 years)				$ 0

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Phase I, Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-123

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design costs

The cost of the conceptual design prepared for this project was $10,000.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and location of project: Tactical bomb production facilities, various locations

2. Project No.: 85-D-125

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3. Date A-E work initiated: 1st Qtr. FY 1985

3a. Date physical construction starts: 4th Qtr. FY 1985

4. Date Construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: $35,800
Date: 1/85

6. Current cost estimate: $35,800
Date: 1/86

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7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$10,000	$ 5,000	$ 5,000	$ 1,467
1986	6,000	9,000	9,000	4,600
1987	12,800	14,800	14,800	12,200
1988	7,000	7,000	7,000	10,400
1989	0	0	0	7,133

8. Brief physical description of project

This project provides for the additional production capacity and new capability required to support the production of additional B61 tactical gravity bombs with safety and security enhancements as projected in the current Nuclear Weapons Stockpile Memorandum. This project funding will provide: new equipment; new buildings and building additions; renovation of some existing structures to adapt them for use in B61 production activities; and special facilities needed for production, certification, and assembly of components. Special facilities will be provided to meet increased production schedules and to implement new technology in safety and security enhancements.

At the Bendix Plant, this project will provide expanded and upgraded facilities in existing space. Approximately 16,000 square feet of existing building space will be modified by installation or relocation of walls; new ceilings and floors; provision of additional temperature, humidity, and dust controls; and extensions of normal factory utilities. Equipment items to be provided include cleaning and conformal coating equipment; tanks, ovens, and process controls; and miscellaneous certification, production, and acceptance equipment. A 5,300-square-foot addition to the main building will be built to accommodate B61 production facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tactical bomb production facilities, various locations	2. Project No.: 85-D-125

8. Brief physical description of project (contd.)

At the Mound Plant, this project will provide equipment for forming and molding plastics, ultrasonic inspection, and miscellaneous certification, production, and acceptance processes. This project will provide a new process line including high vacuum furnaces, new glovebox lines with controlled atmospheres, welders, cleaning and inspection equipment, and specialized gas handling equipment. An existing tritium effluent recovery system will be expanded to control tritium contaminated process gas effluents. No new buildings or building additions are required.

The Y-12 Plant requirements are primarily to support production of the canned subassembly or nuclear secondary. The funding will provide 17,000 square feet of additional production support office space. The addition will be of standard construction to conform to existing criteria. Utilities will be extensions of existing lines. Equipment to be procured includes numerically controlled machine tools and gages; metal preparation and forming furnaces, ovens, and presses; acceptance/inspection equipment; and laboratory support equipment.

At the Rocky Flats Plant, additional equipment will be provided to support technical changes planned for future B61 production. This project will provide the equipment needed for machining and testing. The equipment will include vacuum systems, furnaces, and miscellaneous machine tools. No new buildings or building additions are required.

The requested FY 1987 funding will be used for procurement of equipment, special facilities, and for construction.

Purpose, justification of need for, and scope of project

The purpose of this project is to provide additional production capacity and new capability to improve safety and security features and to increase the B61 tactical bomb production rate. Maximum use will be made of existing capabilities and capacities in the production of these additional B61 bombs, including the facilities provided under Project 82-D-108, Nuclear Weapons Stockpile Improvements, Various Locations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tactical bomb production facilities, various locations

2. Project No.: 85-D-125

10. Details of cost estimate a/

a.	Engineering, design, and inspection at approximately 21 percent of construction costs, item b	$ 5,000
b.	Construction costs and special facilities	22,700
c.	Standard equipment, including procurement and installation	1,900
d.	Process uncertainties	700
	Subtotal	$30,300
e.	Contingency at 18 percent of above costs	5,500
	Total estimated cost	$35,800

Estimates by location are as follows:

Rocky Flats Plant, Golden Colorado	$ 300
Bendix Plant, Kansas City, Missouri	11,500
Y-12 Plant, Oak Ridge, Tennessee	13,000
Mound Plant, Miamisburg, Ohio	11,000
Total	$35,800

11 Method of performance

Design and inspection will be performed under negotiated architect-engineer contracts and by the operating contractors. To the extent feasible, procurement and construction will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

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a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tactical bomb production facilities, various locations
2. Project No.: 85-D-125

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$ 6,067	$12,200	$10,400	$ 7,133	$35,800
Total facility cost	6,067	12,200	10,400	7,133	35,800
2. Other project funding					
(a) Conceptual design costs	150	0	0	0	150
Total other project funding	150	0	0	0	150
Total project funding (items 1 and 2)	$ 6,217	$12,200	$10,400	$ 7,133	$35,950

b. Total related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	$ 3,000
2. Programmatic operating expenses directly related to the facility	7,500
Total other related funding requirements	$10,500

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design costs

Conceptual design costs of approximately $150,000 will be incurred in the process of developing and improving the project cost estimate and schedule.

b. Total related funding requirements

It is estimated that the programmatic life of these facilities will be at least 20 years.

1. Facility operating costs

Approximately $3,000,000 per year will be required to cover the cost of utilities, maintenance, janitorial services, and related overhead costs.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Tactical bomb production facilities, various locations

2. Project No.: 85-D-125

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13. Narrative explanation of total project funding and related funding requirements (contd.)

    2. Programmatic operating expenses directly related to the facility

       The average annual incremental cost of direct labor, tooling procurement, tooling fabrication, and overhead is estimated at $7,500,000 per year.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: TRIDENT II warhead production facilities, various locations

2. Project No.: 84-D-112

3. Date A-E work initiated: 1st Qtr. FY 1984

3a. Date physical construction starts: 1st Qtr. FY 1985

4. Date construction ends: 4th Qtr. FY 1988

5. Previous cost estimate: $158,500
Date: 1/85

6. Current cost estimate: $158,500
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	$19,300	$19,300	$17,914	$ 3,414
1985	60,700	60,700	62,086	21,586
1986	60,700	60,700	60,700	65,500
1987	14,500	14,500	14,500	47,700
1988	3,300	3,300	3,300	20,300

8. Brief physical description of project

This project provides additional production capacity and capability required to support production of the TRIDENT II warhead (W88). Facility requirements for production of the new warhead are described below. In summary, the new facilities to be provided by this project include equipment; building additions; renovation of some existing structures to adapt them for use in TRIDENT II production activities; and special facilities for production, certification, and assembly of components.

At the Y-12 Plant, this project will provide specific new capability for production of new weapon components, including etching facilities, low-voltage imaging system, and a cleaning and packaging facility for metal strips. Additional capacity requirements for production of TRIDENT II warhead parts include a skull caster, abrasive saw, vacuum furnace, precision turning machines, multiaxis mills, a band mill saw, coordinate measuring machines, an ultrasonic gauge, and dye penetrant systems. Existing facilities that will be modified for use in producing the TRIDENT II warhead include preheat ovens, plasma-spray machines, electroplating stations, dryers, crimp welders, life certification and other ovens, a fogbank dryer, a leak test station, a welding system, an adhesive mixing station, and a 2,700-square-foot tool and fixture storage area. A 50,000-square-foot building will be built to provide office space and approximately 8,800 square feet of existing buildings will be built for inspection equipment and for storage. Computer equipment to be provided includes the upgrade of machine controllers to permit interfacing with other production sites.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities, various locations 2. Project No.: 84-D-112

8. Brief physical description of project (contd.)

At the Savannah River Plant, the existing tritium facilities will be modified to provide necessary capability and capacity needed for loading TRIDENT II reservoirs. An existing loading room will be modified to accommodate new loading hoods and required manifolds, pinch welders with associated instrumentation, an air-monitoring system, and an emergency confinement system. The project will also include installation of ion chamber detectors in exhaust duct risers, manifold relief piping, and an exhaust hood diversion system.

The Rocky Flats Plant will require minor renovations to existing buildings and provision of production equipment to handle the workload associated with the TRIDENT II warhead. A bottom pour induction casting furnace and three special coordinate measuring machines will be purchased to support pit fabrication and reservoir work. Additional equipment, including welders, microscopes, x-ray fixtures, x-ray spectrometer, gas chromatograph, and ultrasonic scanning equipment will be required. This project will provide for modification of existing safe-secure railcars which is necessary for shipping the TRIDENT II warhead. The safe-secure vehicles will be modified at the Rocky Flats Plant. Two escort rail coaches will be modified for use in safeguarding rail shipments. This project will also provide modifications to existing highway transportation equipment if rail shipment of the warhead assembly is curtailed.

Construction at the Bendix Plant will include a 2,600-square-foot expansion in the Miniature Radar Assembly Facility. This will involve construction of walls; modifications to the existing heating, ventilating, and air-conditioning system; and provision of environmental controls to control relative humidity and temperature conditions. Equipment to be installed in the radar assembly area includes a spectrum analyzer, radiofrequency signal generators, oscilloscopes, pulse generators, frequency counters, and related miscellaneous equipment. Rearrangement of the Electrical and Special Firing System Assembly Facility will include adding 7,600 square feet of floorspace for testing and encapsulation equipment. The space will be acquired from an adjacent manufacturing area. Similar environmental controls will be provided for the space addition. This additional capacity is required to accommodate testing equipment and polyurethane foam encapsulation equipment. This upgrade will include a new air-conditioning system, a grounded conducting floor, mini welder, foam production equipment, and miscellaneous development and assembly equipment. A new 2,200-square-foot microcircuit assembly area will be built for manufacturing and testing the TRIDENT II warhead radar. This area will be a Class 100,000 clean room with 30 percent maximum relative humidity controls and will be equipped with the necessary manufacturing, testing, and support equipment.

The existing Bendix Plant printed wiring board manufacturing and inspection facility will be relocated and expanded. The new 24,000-square-foot facility will include a grated area for plating and etching operations. Construction will include new walls, ceilings, lights, sprinklers, exhaust systems, acid and caustic waste lines, sanitary sewers, and dedicated environmental controls. Equipment to be installed in the new printed wiring board facility will include automatic solution controllers, machining equipment, inspection equipment, and a new photolithography system. The existing printed wiring board manufacturing capacity and inspection facility lacks the capacity needed to accommodate TRIDENT II radar requirements. The planned relocation and expansion are required to provide space for additional production and inspection equipment. In

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities, various locations

2. Project No.: 84-D-112

8. Brief physical description of project (contd.)

addition, the existing photolithography system in current use will be replaced with a new system to eliminate further use of chlorinated hydrocarbon solvents and associated environmental pollution control requirements. Existing facilities located on the mezzanine level of the main manufacturing building must be relocated to eliminate potential structural damage to the building.

This project will provide additional support equipment at the Bendix Plant for use in producing TRIDENT II warhead components. Major equipment items include an attenuation measurement system, power measurement system, and a voltage standing wave ratio measurement system for the calibration of the arming, firing, and fusing electronic assemblies. An engineering diagnostic system is also required for development testing and failure analysis of the arming, firing, and fusing assemblies. A new automatic wire bonder and hermetic sealer are required in producing hybrid microcircuits for the TRIDENT II.

Requirements at the Mound Plant for production of TRIDENT II warhead components include 120 pieces of equipment, renovation of existing production space in eight locations, and construction of three support buildings and a new detonator production building. Improved capabilities and capacity will be provided in the following areas. Modifications will be made to existing detonator production facilities to provide a suitable clean room environment and to accommodate equipment for automated parts manufacture. A new 25,000-square-foot parts manufacturing building will be built to accommodate new machine tools needed to produce TRIDENT II timer parts. A five-story central operational support building of approximately 50,000 square feet will be built into a hillside. This structure will provide test and process assembly areas and offices, physical standards laboratories and offices, and offices for process engineering, materials development, and isotopes separation personnel. An addition of approximately 80,000 square feet will be built on the existing four-story Administration Building to provide office space, a conference room, and a classified document distribution center. In the same building, 10,000 square feet of existing space will be renovated to provide suitable space for new office employees to work while awaiting clearance, to provide space for communications equipment, and to accommodate an emergency response communications center. A new two-story process support building of approximately 11,000 square feet will be built in the special metallurgy area to provide offices, a conference room, lobby, storage, shops, and offices for approximately 60 people. Surface analytical instrument and electron microprobe will be installed for use with high explosives to determine materials compatibility, integrity, and quality assurance. Increased cleanliness requirements in the timer manufacturing area will include installation of a new press, a new laser welder, a new dry atmosphere enclosure, a moisture monitor, and a pressurization system.

New manufacturing technology will include high explosive material characterization and detonator testing equipment. An existing coating development (beam tape) facility will be modified and existing equipment will be relocated to accommodate TRIDENT II detonator production and inspection. New equipment will be provided for manufacture of a new variety of detonators. A remotely operated high explosive disassembly lathe with TV monitoring will be provided along with a high explosive incinerator, a laser welder, a 100,000 psi pressurization system, a glue bonding digital readout and data processor, and miscellaneous monitoring equipment. Other major items of equipment to be procured and installed at the Mound Plant include a computer controlled machining center, a surface grinder, a laser measurement system, and an electrical discharge

8. Brief physical description of project (contd.)

machining center. A new reservoir component evaluation system will be installed in an existing glove box and will include modifications to the gas expansion system, pressure-volume-temperature (PVT) analytical equipment, a drill system and related alignment, and positioning equipment needed to accommodate the TRIDENT II reservoir.

At the Pinellas Plant, this project will provide production and test equipment to meet TRIDENT II mission assignments of the plant. The following equipment will be installed in existing manufacturing space or in the 30,000 square-foot new building additions to be provided under this project. New equipment will include a vacuum furnace, silk screen printer, sintering furnace, a numerically controlled spinning lathe, real time x-ray inspection system, calibration and testing equipment, and automated assembly facilities.

The Pantex Plant will be provided with standard equipment needed for production support for the TRIDENT II warhead. An accelerated aging test unit will be built which will include a temperature chamber with sampling and recording equipment. Pressure and humidity measurement devices and temperature programmers will be installed to support materials compatibility testing.

The TEC provides $4,500,000 to cover facility design and production/process uncertainties that have not been resolved at this time. Included in this amount are potential costs for a Reaction Injection Molding Machine, thickness gages, quality evaluation equipment, and a facility upgrading for the production of beryllide powder.

The requested FY 1987 funding will be used to complete construction, continue equipment procurement and installation, and finish the safe-secure railcars modification.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide new capabilities and additional production capacity to meet currently established requirements for the TRIDENT II warhead.

Maximum use will be made of existing capacities and capabilities in preparing for production of the TRIDENT II warhead. Unique features of this warhead will require capabilities not currently available in the production plants. The facilities to be provided by this project are required to produce the warhead as scheduled in the current Nuclear Weapons Stockpile Memorandum. The Department of Energy (DOE) and the Department of Defense (DOD) have entered into an agreement to proceed with Phase 3 development engineering for the TRIDENT II warhead. The first production unit is scheduled for October 1988.

A serious deficiency in office space presently exists at the Y-12 Plant as a result of personnel increases associated with weapon production increases over the past several years. Some employees are sharing desks. Some supervisors are sharing

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities, various locations

2. Project No.: 84-D-112

9. Purpose, justification of need for, and scope of project (contd.)

offices with their employees. Office spaces have been lost in the past to expansion of production and computer facilities. Subsequent replacements by temporary trailers and building modifications have not kept pace with the office space requirements. The existing office space provides a crowded, poor quality environment for professionals who directly support production activities. The office space shortfall at the end of 1986 is projected at approximately 95,000 square feet. The office building to be provided by this project will provide approximately 27,000 square feet of usable office space and will accommodate 225 people. Approximately 265 personnel requiring office space will be assigned to TRIDENT II production.

10. Details of cost estimate a/

	Total cost
a. Engineering, design, and inspection at approximately 12 percent of construction, standard equipment, and process uncertainties	$ 15,500
b. Construction costs and special facilities	57,000
c. Standard equipment, including procurement and installation	61,150
d. Modification of safe-secure rail cars	4,150
Subtotal	137,800
e. Contingency at approximately 12 percent of above costs	16,200
f. Design and process uncertainties	4,500
Total estimated cost	$158,500

Estimates by location are as follows:

Y-12 Plant, Oak Ridge, Tennessee	$ 44,500
Rocky Flats Plant, Golden, Colorado	20,000
Bendix Plant, Kansas City, Missouri	26,150
Mound Plant, Miamisburg, Ohio	40,700
Pinellas Plant, St. Petersburg, Florida	16,000
Savannah River Plant, Aiken, South Carolina	2,000
Pantex Plant, Amarillo, Texas	5,000
Albuquerque Operations Office, Albuquerque, New Mexico (safe-secure rail cars)	4,150
Total	$158,500

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a/ Estimate based on preliminary warhead design information and completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities, various locations
2. Project No.: 84-D-112

11. Method of performance

Design and inspection will be performed primarily by the operating contractors and, where feasible, under negotiated architect-engineer contracts. Equipment procurement, inspection, and installation will be performed by operating contractors.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	$ 90,500	$ 47,700	$ 20,300	$158,500
Total facility costs	90,500	47,700	20,300	158,500
2. Other project funding				
(a) Conceptual design costs	770	0	0	770
Total other project funding	770	0	0	770
Total project funding (items 1 and 2)	$ 91,270	$ 47,700	$ 20,300	$159,270

b. Other related funding requirements (estimated life of project: 10 years)	
1. Facility operating costs	$ 10,780
2. Programmatic operating expenses directly related to the facility	21,000
Total other related funding requirements	$ 31,780

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design

Conceptual design costs of $770,000 have been incurred in the process of developing and improving the project cost estimate and schedule.

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be at least 10 years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities, various locations	2. Project No.: 84-D-112

13. Narrative explanation of total project funding and other related funding requirements (contd.)

1. Facility operating costs

   Facility operating costs include utilities, maintenance, janitorial services, and related overhead.

2. Programmatic operating expenses directly related to the facility

   Programmatic operating expenses include direct labor, materials and supplies, procurement and fabrication of tooling, and overhead.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations
2. Project No.: 84-D-113
3. Date A-E work initiated: 2nd Qtr. FY 1986
3a. Date physical construction starts: 2nd Qtr. FY 1987
4. Date construction ends: 4th Qtr. FY 1990
5. Previous cost estimate: $135,500
Date: 1/85
6. Current cost estimate: $125,700
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$10,000	$ 5,000	$ 5,000	$ 4,000
1987	47,000	47,000	47,000	37,000
1988	58,800	63,800	63,800	52,500
1989	8,900	8,900	8,900	25,500
1990	1,000	1,000	1,000	6,700

8. Brief physical description of project

This project provides additional production capacity and capability required by the weapons production complex to produce nuclear warheads for the antisubmarine warfare/standoff weapon (ASW/SOW) program. Capital requirements at the weapons production plants will consist primarily of standard equipment, special facilities, and additions to existing buildings needed to build weapon components. Following are descriptions of new construction to be provided at each site.

At the Bendix Plant, a 1,600-square-foot modular-type environmentally controlled room will be procured and installed inside the main manufacturing building. Environmental controls will maintain the room at 68°± 0.5°F. Preparation for this installation will include removal of existing walls, ceilings, ductwork, and sprinkler piping. Existing equipment will be relocated. Following installation of the modular facility, modified walls, ventilation, and fire protection systems will be replaced. Additional equipment will be procured and installed at various locations throughout the plant. This standard equipment will include plasma treatment equipment, a high precision coordinate measuring machine, a duplex mill, automated production and inspection equipment, and foam processing equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

8. Brief physical description of project (contd.)

At the Pinellas Plant, this project will provide procurement and installation of standard production and test equipment needed for the processing and processing support activities directly associated with the manufacture of ASW/SOW neutron generators and other components included in the Pinellas Plant mission assignment. This project will also provide material transport systems, work station control centers, and automated machine shop equipment such as direct numerically controlled lathes and mills.

At the Pantex Plant, available building space will be modified for special facilities and new equipment needed for ASW/SOW production. An accelerated aging unit and testing system will involve construction of a test chamber and associated sampling and recording equipment. Standard equipment including process equipment, analytical and certification equipment, and process robotics will be provided to support production and final warhead assembly. A 3,600-square-foot automation and remote operations testing facility will be built.

At the Mound Plant, this project will provide for approximately 210 pieces of equipment for analytical support, product testing, standards calibration, manufacturing advanced devices, material testing and evaluation, nuclear safety requirements, component evaluation. Five building modifications or additions of approximately 27,000 square feet will be built for materials compatibility determinations, for thermal testing, for explosives and thermite preparations, and for ion implementation.

At the Rocky Flats Plant, existing production space will be modified to accommodate new production equipment needed for fabrication of ASW/SOW component parts. This project will provide machine tools, process equipment, inspection devices, and laboratory equipment for use in producing the new weapon components. All new equipment will be installed in existing buildings. Forty-seven pieces of equipment have been identified, including a plasma spectrometer, a numerically controlled hole drilling machine, T-base lathes, a foundry furnace, coordinate measuring machines, and large electron beam welders. Major modifications will be made to Building 777. Significant equipment installation costs have been identified.

At the Y-12 Plant, this project will provide new equipment and process systems such as a vacuum heat treating furnace, an automated manufacturing center, a plate thickness gauge, and specialized material test and certification equipment.

The cost estimate for this project has been reduced by $9,800,000 since the FY 1986 budget submittal as a result of improved definition of warhead design and completion of conceptual design of the production facilities. The current cost estimate includes $11,900,000 for design and process uncertainties at three production plants that remain to be resolved. Of this amount, $5,500,000 covers design and process uncertainties at the Bendix Plant to cover an analytical chemistry laboratory if

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

8. Brief physical description of project (contd.)

required to test a component and to cover production capacity unknowns associated with potential schedule variations. At the Rocky Flats Plant, $4,000,000 has been included for uncertainties in design and production facilities planned.

The FY 1987 funding requested will be used for design, procurement of long-lead equipment, and for starting building modifications at Rocky Flats and Mound Plants.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide new capabilities and additional production capacity to meet established warhead requirements for the ASW/SOW.

Maximum use will be made of existing capacities and capabilities in preparing for production of the ASW/SOW warhead. Unique features of the weapon will require capabilities not currently available in the production plants. The additional number of parts added to the production workload will require additional capacity at the production plants. The facilities to be provided by this project are required to produce the ASW/SOW warhead as scheduled in the current Nuclear Weapons Stockpile Memorandum. The Department of Defense and the Department of Energy (DOE) plan to enter into an agreement to proceed with development engineering (Phase 3) in April 1986.

The completion schedule and cost estimate for production of the ASW/SOW warhead rely upon the availability of facilities to be provided by previously authorized weapons systems including facilities funded under Project 81-D-115, Missile X Warhead Production Facilities, and facilities included in Project 84-D-112, TRIDENT II Warhead Production Facilities.

Reliance upon Project 82-D-109, 155mm AFAP Production Facilities, has been terminated and the necessary shared facilities have been included in this project. The FY 1985 estimate for the ASW/SOW project relied upon the availability of facilities and equipment, valued at approximately $9,000,000, to be provided under Project 82-D-109. Subsequently, the latter project has been redeveloped to utilize facilities equipment that will be made available from the production facilities of the 8-inch AFAP (W79). The cost estimate for Project 82-D-109 no longer includes funding for facilities previously planned for joint use with ASW/SOW production.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

9. Purpose, justification of need for, and scope of project (contd.)

The total estimated project cost was reduced by about $10,000,000, primarily due to improved design definition on the ASW/SOW warhead. This enabled the Rocky Flats Plant to reduce significantly funding requirements that were initially estimated to support two design options.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 16 percent of construction costs, item b		$ 9,700
b. Construction costs		60,400
(1) Building additions and modification of existing buildings	$ 11,730	
(2) Special facilities, including installation of production equipment and processing systems	48,670	
c. Standard equipment		26,200
Subtotal		96,300
d. Contingency at approximately 18 percent of above costs		17,500 b/
e. Design and process uncertainties		11,900
Total estimated cost		$125,700

The estimates by location are as follows:

Bendix Plant, Kansas City, Missouri	$ 8,800
Pinellas Plant, St. Petersburg, Florida	11,020
Pantex Plant, Amarillo, Texas	4,000
Rocky Flats Plant, Golden, Colorado	17,590
Mound Plant, Miamisburg, Ohio	41,450
Y-12 Plant, Oak Ridge, Tennessee	30,940
Uncertainties	11,900
Total	$125,700

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a/ Based on completed conceptual designs.

b/ Contingency applies to work to be performed in FY 1986, FY 1987, FY 1988, FY 1989, and FY 1990.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

11. Method of performance

Design and inspection will be performed under negotiated architect-engineer contracts and by the operating contractors. To the extent feasible, procurement and construction will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	$ 4,000	$37,000	$52,500	$25,500	$ 6,700	$125,700
Total facility costs	4,000	37,000	52,500	25,500	6,700	125,700
2. Other project funding						
(a) Conceptual design costs	180	0	0	0	0	180
Total other project funding	180	0	0	0	0	180
Total project funding .... (items 1 and 2)	$ 4,180	$37,000	$52,500	$25,500	$ 6,700	$125,880

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	$ 1,580
2. Programmatic operating expenses directly related to the facility	3,250
Total other related annual funding requirements	$ 4,830

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design costs

Conceptual design costs of approximately $180,000 will be incurred in the process of developing and improving the project cost estimate and schedule.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 20 years.

1. Facility operating costs

Facility operating costs of approximately $1,580,000 per year are projected to cover the costs of utilities, maintenance, janitorial services, and related overhead.

2. Programmatic operating expenses directly related to the facility

Programmatic operating costs of approximately $3,250,000 per year are projected to cover direct labor, fringe benefits, production materials and supplies, and related overhead.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee
2. Project No.: 84-D-124
3. Date A-E work initiated: 1st Qtr. FY 1985
3a. Date physical construction starts: 2nd Qtr. FY 1985
4. Date construction ends: 4th Qtr. FY 1989
5. Previous cost estimate: $56,000
Date: 1/85
6. Current cost estimate: $45,400
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	$ 7,600	$ 0	$ 0	$ 0
1985	21,400	17,000	17,000	3,887
1986	0	12,000	12,000	17,000
1986 Sequestered	(0)	(720)	(720)	(0)
1987	10,000	10,000	10,000	14,000
1988	6,400	7,120	7,120	6,000
1989	0	0	0	4,513

8. Brief physical description of project

This project provides for construction of new facilities and modification of existing facilities for the handling and treatment of liquid and solid wastes and for the containment and elimination of major pollution sources and hazards. Twelve subprojects to be completed by this project are categorized in three primary classes of environmental control activities: (1) liquid waste disposal; (2) solid waste disposal; and (3) general environmental control and support.

Facilities for liquid waste disposal improvements will be provided by five subprojects:

1. A waste water treatment facility will provide for treatment of acid and caustic discharges from the Y-12 coal yard and steam plant. It will include facilities such as concrete-lined collection ditches for directing coal yard runoff, a collection basin for flow equalization and settling coal fines, a chemical system for neutralizing the waste water and for precipitating trace metals, a clarifying system, and a sludge dewatering system. About 3,000 square feet of new building space will be built for instrumentation and controls and for various equipment requiring weather protection.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee
2. Project No.: 84-D-124

8. Brief physical description of project (contd.)

2. Plating rinse water waste treatment will be accomplished by installation of a facility for processing about 8 million gallons per year of plating rinse water. Chemical and electromechanical treatment process system and filtration and clarification treatment will be provided. Associated collection tanks, pumps, piping, and instrumentation for systems operation are included.

3. National Pollutant Discharge Elimination System requirements of the Environmental Protection Agency (EPA) will be supported by construction of approximately 15 monitoring stations which will include flow measurement equipment, continuous pH and temperature monitors, and flow proportional samplers. A 100-square-foot building will be built at each station to house instrumentation and monitors.

4. Source collection and treatment facilities will be built to collect and treat effluents from the Y-12 Plant production buildings. These facilities will include collection tanks, spill containment, piping, and truck loading stations to handle about 130,000 gallons per year of decontamination waste water, indeterminant quantities of acid pickling waste and rinse water from the uranium foundry, and about 30,000 gallons per year of photographic fixer solution and other waste streams. Contingency provision has been made to collect and treat dilute rinse solutions from photographic film development if required by EPA.

5. A facility will be provided at the west end of the plant for treatment of approximately 2 million gallons annually of nitrate and other contaminant bearing process waste waters. Head end treatment of received wastes, such as pH adjustment, heavy metal precipitation, and biological nutrient addition will be accomplished in seven new 6,000-gallon agitated waste storage tanks and a 15,000 gallon reactor vessel. Adjusted wastes will be transferred to existing 500,000-gallon biodenitrification and bio-oxidation reactors. The biotreated waste waters will be filtered in new activated carbon packed beds prior to chlorination. The chlorinated waste water will be retained for 24 hours in one of three existing effluent equalization basins before discharge through a new National Pollution Discharge Elimination System monitoring station to the East Fork Poplar Creek. Waste sludge will be collected in a sludge holding tank before acceptable disposal. A prefabricated industrial-type steel frame building with about 12,000 square feet of ground floor space and about 3,800 square feet of mezzanine space will be provided to protect against freezing the waste treatment systems in winter and to provide space for storage, maintenance, operating controls, changehouse, and truck unloading.

Solid waste disposal improvements will be provided in two subprojects:

1. Approximately 32,000 cubic feet of reinforced concrete vaults will be built to provide environmentally acceptable storage for uranium oxide.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-124

8. Brief physical description of project (contd.)

2. Construction will be provided to facilitate reduction or elimination of contamination in surface and subsurface waters in the Bear Creek Valley watershed area. Four sub-suprojects supporting required remedial actions are as follows:

2a. Leachate control at waste burial sites. This construction will consist primarily of earthwork for surface-drainage control, site grading, and construction of approximately 23 acres of impervious capping. Individual waste burial sites will be stripped of vegetation. Capping will be provided to prevent leaching of contaminants from buried wastes by precipitation. The capping will consist primarily of a clay layer with an additional impervious fabric membrane and an overlying soil layer. Vegetation will be reestablished for erosion control.

2b. Removal of PCB-contaminated oil retention ponds. PCB-contaminated liquids and solids in oil retention ponds will be removed and stored for future disposal, and leachate collection system will be installed. Surface drainage control will be provided to reduce the intrusion of rain water into the construction area. A storage tank will be provided nearby for retention of the PCB-contaminated pond liquids. Approximately 4000 cubic yards of PCB-contaminated sludge and soils will be excavated and stored in a roofed, concrete vault to be built nearby. The excavation area will be protected from precipitation by an impermeable clay cap. A seepage collection system will be built to intercept and divert the contaminated seepage from the excavated site for collection and processing.

2c. Ground water Treatment Facility. A facility will be built to treat contaminated ground water at the Y-12 Plant. The primary objective of the facility is to enable the Y-12 Plant to remove highly contaminated ground water from specific locations in the watershed and to treat the recovered ground water by removing the contaminants of concern. The facility will be sized and designed to treat groundwater proven to contain very high concentrations of contaminants. Land improvements will include roads, paved parking, fencing, and security lighting. A 4,800 square feet, preengineered building on a concrete slab will be provided to house the water treatment process. An equal amount of covered space will be provided as an attached canopy built on the process building for the protection of truck unloading operations and outside storageand processing tanks. The water treatment process facilities will provide continuous biodenitrification reactors designed for a nominal 3-gallons-per-minute throughput capability of 10 gallons-per-minute for pH adjustment, removal of heavy metals, removal of organics, and clarification of contaminated water.

2d. Support facilities. In support of the removal of PCB-contaminated soils and sludges from the oil retention ponds, a 14,000 square feet concrete storage vault will be constructed. It will be covered by a metal pre-engineered roof structure and will include an internal drainage and collection system. Liquid storage facilities to receive and store contaminated oil and water will include a concrete foundation and diking system for storage tanks, a truck unloading station with spill and leakage containment, one 500,000-gallon storage tank, two 10,000-gallon storage tanks, and the necessary oil separator, pumps, and piping.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-124

8. Brief physical description of project (contd.)

An operations support building will be located in the Bear Creek Burial Grounds. Area preparation will include construction of roads, fencing, and vehicle parking. The building will consist of about 2,900 square feet of gross space and will be equipped for supervisory offices, change rooms, lunch room, and restrooms. Utilities to be provided will include potable water, power, area lighting, and water for fire protection.

General environmental control measures are included in the following five subprojects:

1. Five new 40,000-gallon tanks will be built on a new diked concrete pad for storage of waste oils containing polychlorinated biphenyls (PCB), uranium, or other contaminants. Separation systems for waste oils will be provided.

2. Facilities for transfer and collection of plant chemical wastes including spill containment capability will be provided. A tank facility comprised of four 10,000 gallon tanks diked for spill containment will be provided for waste solution collection prior to transfer to waste treatment facilities. Approximately 10,000 gallons of double contained storage will be provided for collection of flammable liquids scheduled for later incineration.

3. An existing analytical laboratory will be refurbished and expanded to handle a tenfold increase in workload recently imposed by environmental concerns and agreements for corrective actions with the State of Tennessee and the EPA. This subproject will refurbish approximately 10,000 square feet of space in an existing building to support environmental laboratory activities. Some existing laboratory equipment will be relocated to the expanded area and some new equipment will be provided. The additional laboratory capacity will be utilized for water, sample preparation, and analyses in support of waste material processing, transportation and disposal, salvage operations, and personnel monitoring programs.

4. This subproject will provide for replacement of approximately 40 PCB-filled in-service electric transformers located in areas representing high environmental risk from the hazardous PCB. (Additional PCB-filled in-service transformers which will require replacement are included in Project 86-D-123, Environmental Hazards Elimination, various locations.)

5. New building space of about 30,000 square feet will be provided as an environmental operations support base. This support base will provide changehouse facilities for about 100 operating personnel, a field laboratory, office space for approximately 40 environmental staff and maintenance staff personnel, a utilities field office, a light maintenance shop, and storage space for operations and maintenance equipment. Other provisions include terminal facilities for the waste tanker fleet including a diked parking area for loaded tankers waiting analyses of their waste contents, a tanker rinse facility, and a solution transfer station.

Special facilities to be provided under this project consists primarily of special vehicles required for excavation and transportation of waste from cleanup actions. Some of the vehicles will require modifications to protect operators from direct contact with contaminated materials. Most of the vehicles will become contaminated and may be unuseable for other

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-124

8. Brief physical description of project (contd.)

purposes if decontamination is not feasible. The vehicles include one 300-horsepower bulldozer, three 5-cubic yard frontend loaders, one 5,000-gallon tanker, two 6-cubic yard watertight containers (dumpsters) for sludge hauling, and portable water pumps.

Standard equipment included in this project includes liquid waste tank trailers, office furniture and laboratory equipment.

The cost estimate revision is based on a significantly revised definition of work to be accomplished. The preceding narrative describes the work currently planned and is supported by a completed conceptual design. The total estimated cost of the project has been reduced from $56,000,000 to $45,400,000 primarily through deletion of three subprojects. Following is a summary of changes to the initial project scope:

1. A 500-square-foot building planned for operational support at an existing uranium chip oxidizer facility was built using general plant project funds.

2. The subproject which called for demolition and decommissioning of a mercury-contaminated process facility that has been idle for many years has been deleted from this project. The results of recently completed engineering studies of various dismantling and decontamination options indicate that the cost for completing this project as initially planned would greatly exceed the initial estimate. Further studies are warranted to determine if there are less costly viable alternatives for dismantling and decontaminating the facility or if there are acceptable alternatives to dismantling and decontamination to solve the problems associated with the facility in its existing condition. Upon completion of these studies and selection of a preferred course of action, funding for this subproject will be requested. In the interim, construction planned under Project 85-D-121, Air and Water Pollution Control Facilities, Y-12 Plant, will isolate the site of this mercury-contaminated building to control and collect any mercury contaminated drainage.

3. The subproject previously requested for initial site development of approximately 25 acres for a new central waste disposal facility has been deleted from this project. Responsibility for developing and operating this facility for disposal of low-level radioactive waste from all Oak Ridge Operations Office (ORO) activities including the Y-12 Plant, has been assigned to the Department of Energy (DOE) Defense Waste and Byproducts Management Division, Assistant Secretary for Nuclear Materials. Funding required to plan a facility for disposal of low-level radioactive wastes from Y-12 Plant activities has been requested in the Defense Waste and Byproducts Management budget under Project 86-D-123, Central Waste Disposal Facility.

4. The subproject at the west end of the Y-12 Plant for a facility to treat contaminated waste waters has been changed to include a 15,800-square-foot building to enable year-round operation of the waste treatment systems and provide space for support operations. Minor changes have been made in several other subprojects.

The requested FY 1987 funding will be used for design, procurements, and construction of the subprojects described above.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-124

9. Purpose, justification of need for, and scope of project

The purpose of this project is to attain compliance at several environmental areas by both the State of Tennessee Department of Health and Environment (TDHE) and the EPA. This project is needed to bring several facilities throughout the Y-12 Plant into compliance with a number of environmental laws and regulations. These include the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), and the Toxic Substances Control Act (TSCA). The CWA's requirements apply to all subprojects of the environmental improvements line item. The CWA requires the application of the National Pollutant Discharge Elimination System (NPDES) permit to the Y-12 Plant site. That permit requires a high degree of treatment to all process-related waste waters originating within the plant. It also requires the application of Best Management Practices to all operations within the plant. This program will cover both sources of pollution emanating from process as well as area sources of pollution resulting from past operations and storage practices. Sections of the regulations resulting from the CWA relate to spill prevention and control at a number of waste and chemical materials storage sites throughout the facility. The objective of such projects is to preclude or mitigate the potential of any toxic or hazardous substances or wastes from reaching the waters of the State of Tennessee.

The waste water treatment and collection facilities to be provided by this project will provide the capability to meet the best available technology requirements for the waste waters generated by the Y-12 Plant. These best available technology standards are very stringent requirements for the elimination of metals and toxic organics from process waste waters.

The proposed construction is necessary under an agreement reached by the DOE, the EPA, and TDHE. This Memorandum of Understanding (MOU) mandates a number of activities, all related to the elimination of process waste waters and point source contamination from reaching the East Fork Poplar Creek. This creek originates within the plant area and flows through the City of Oak Ridge. The same requirements are also set forth in TDHE's Complaint and Order, which sights a number of areas of noncompliance with Tennessee Water Pollution Control Regulations and seeks relief from past practices. Completion of this project provides for compliance with those legal requirements as well as those of the (NPDES) permit. Finally, the design and construction milestone dates for the waste water treatment and collection facilities are required to be met according to the Federal facilities compliance agreement between the EPA and DOE.

RCRA and CERCLA apply to those projects associated with solid waste and with disposal area remedial actions in the Bear Creek burial ground. These actions have also been covered by the MOU, Complaint and Orders, and Orders for Correction mandating compliance with Tennessee Hazardous Waste Management Act and the Tennessee Water Quality Act. The environmental improvements project will enable proper management of solid wastes and hazardous wastes in full compliance with the Federal and state regulations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee   2. Project No.: 84-D-124

9. Purpose, justification of need for, and scope of project (contd.)

Liquid waste disposal

The current practice of discharging diluted untreated effluents such as acids, caustics, and plating wastes to local streams is in violation of requirements of the Federal Water Pollution Control Act. Liquid waste will be intercepted at the sources and treated by the proposed facilities. These facilities include waste collection tanks, dikes, piping, and package treatment units and monitors for treated effluents to assure compliance with discharge permits.

Solid waste disposal

Construction required to support remedial actions in the Bear Creek Valley watershed area has been refined in this FY 1987 construction project data sheet. A Complaint and Order issued in December 1983 by the Tennessee Department of Health and Environment (TDHE) required DOE to submit a proposal and schedule for remedial action to eliminate contaminants in the Bear Creek Valley. The DOE proposal, submitted on July 1, 1984, called for completion of an extensive investigation of Bear Creek Valley where past DOE waste disposal burials have contaminated local groundwater and surface water (Bear Creek). The proposed investigation was completed by DOE in July 1985. The results were reported to TDHE by DOE Oak Ridge Operations Office together with proposed remedial actions. The facilities included in this construction project will support the initial remedial actions proposed to and required by TDHE for elimination of contaminants in Bear Creek Valley. Remedial actions to be accomplished include: reduction of leachate generation; removal of polychlorinated biphenyl (PCB) contaminated soils and water; and an initial step in decontaminating groundwater. The remedial actions supported by this project are mandatory under existing agreements between DOE Oak Ridge Operations Office, TDHE, and the Environmental Protection Agency (EPA).

The groundwater treatment facilities to be provided are required at the earliest possible date for removal and treatment of groundwater proven to contain very high concentrations of contaminants. These facilities will remedy the "worst-case" groundwater contamination. The treatment facilities provided by this project will not solve all known groundwater problems in the Bear Creek Valley. The total quantity of contaminated groundwater that will require treatment has not been established.

It is noted that this project supports only immediately required remedial actions in the Bear Creek Calley Waste Disposal Area, as agreed to by EPA, TDHE, and DOE. Future remedial work beyond that which is included in this project will be required. Additional requirements will be determined following completion of an Environmental Impact Statement now in progress and scheduled for completion in mid-1987.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 84-D-124

9. Purpose, justification of need for, and scope of project (contd.)

General environmental control measures

Other environmental hazards that require elimination include replacement of power transformers containing PCBs, separation of contaminated waste oil and solvent and processing for commercial sale or other acceptable disposal, additional storage tank capacity, and additional diking of several storage facilities within the plant to control chemical spills.

Expansion of the Y-12 Plant laboratory is required to handle a significantly increased workload for environmental sampling and to provide a lower radioactive background for environmental sample analyses.

The extensive environmental control facilities provided by this line item project are the result of mandates by Federal and State of Tennessee regulatory agencies. The regulatory requirements apply to a large number of contamination sources distributed widely among many buildings and operations at the Y-12 Plant site. To assure that the requirements will be met, environmental operations support facilities will be provided to consolidate and centralize the functions of environmental control.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 22 percent of construction costs, item b ..		$ 6,400
b. Construction costs		29,600
(1) Buildings		
(a) Process buildings, approximately 23,800 square feet at about $100 per square foot	2,400	
(b) Process support buildings, approximately 35,000 square feet at about $80 per square foot	2,800	
(2) Building and laboratory modifications, approximately 10,000 square feet at about $125 per square foot	1,300	
(3) Special facilities	18,700	
(4) Utilities, including electrical power, water, steam, and sanitary sewer lines	4,400	
c. Standard equipment including vehicles, laboratory equipment and furniture		100
Subtotal		$36,100
d. Contingency at approximately 26 percent of above costs		9,300
Total project cost		$45,400

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a/ Cost estimated based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 84-D-124

11. Method of performance

To the extent feasible, design will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$20,887	$14,000	$ 6,000	$ 4,513	$45,400
Total facility cost	20,887	14,000	6,000	4,513	45,400
2. Other project funding					
(a) Conceptual design cost	100	0	0	0	100
Total other project funding	100	0	0	0	100
Total project funding (Items 1 and 2)	$20,987	$14,000	$ 6,000	$ 4,513	$45,500

b. Other related funding requirements (estimated life of project: 20 years)	
1. Facility operating costs	$ 4,250
2. Programmatic operating expenses directly related to the facility	3,400
Total other related annual funding requirements	$7,650

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding
   (a) Conceptual design cost
   The cost of preparing a conceptual design for this project will be approximately $100,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-124

13. Narrative explanation of total project funding and related funding requirements (contd.)

b. Total related funding requirements

1. Facility operating costs

The facility operating costs estimated for this project at $4,250,000 per annum include utilities, labor, material, anc supplies for maintenance and janitorial services. Of this cost approximately $2,250,000 per annum is projected for operating the groundwater treatment facility.

2. Programmatic operating expenses directly related to the facility

The programmatic operating expenses associated with operating the facilities provided by this project include direct labor, fringe benefits, and overhead costs plus the cost of supplies and materials required in the operation.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-211

3. Date A-E work initiated: 1st Qtr. FY 1985

3a. Date physical construction starts: 1st Qtr. FY 1985

4. Date construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: $68,000
Date: 1/85

6. Current cost estimate: $68,000
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	$ 7,500	$ 0	$ 0	$ 0
1985	8,000	8,000	8,000	4,217
1986	7,500	13,000	13,000	15,983
1986 Sequestered	(0)	(780)	(780)	(0)
1987	28,000	30,000	30,000	27,600
1988	17,000	17,780	17,780	16,900
1989	0	0	0	3,300

8. Brief physical description of project

This project provides for the installation of new facilities and systems and modifications to existing facilities and systems to upgrade the safeguards posture of the Y-12 Plant. The project, as currently defined, includes the following items:

a. Closure and control of Bear Creek Road

Includes barriers with hardened guard portals on the east and west end of Bear Creek Road, identification check booths on Bear Creek Road, and unmanned vehicle barriers on secondary roads.

b. Guard Towers

Includes two hardened, elevated guard towers with two-level firing ports, emergency power, external lighting, and necessary utilities service. One tower would be located on the north side of the plant and one on the south side of

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-211

8. Brief physical description of project (contd.)

the plant. In addition, smaller guard towers will be constructed consisting of an enclosed base with a hardened guard booth on the top. Four of these towers will be located along the protected area perimeter and four will be located along an adjacent patrol road.

c. Relocation of construction contractor

Covers construction of approximately 37,500 square feet of new floor space to provide for relocation of the onsite construction contractor from the present location to a location west of the plant.

d. Perimeter intrusion detection/assessment system (PIDAS)

Involves the construction of approximately 14,000 feet of new double fencing around the plant protected area, installation of three levels of alarm sensors with closed circuit television (CCTV) assessment capability, and upgrading of lighting. It also provides for demolition/relocation of utilities as required to facilitate construction and replacement of parking space and storage vault space lost due to construction. A new coal conveyor and hopper system will be provided to get coal into the protected area where the steam plant exists. In addition to the plant protected area, Israeli taut wire and improved lighting will be installed along portions of the existing outer plant perimeter fence. Data panels will be provided to collect the taut wire signal inputs and multiples them to both the existing central alarm station on a newly provided secondary alarm station. This system also includes eight additional guard towers, four located along the protected area boundary and four located along the south patrol road. (See Item 8b. above.)

e. Harden personnel monitor stations and material access areas

Existing personnel monitoring stations located at the entrances of the Material Access Areas (MAAs) will be replaced. New hardened stations will provide facilities such as automated credential and personnel identification verification, improved Special Nuclear Material (SNM) detection systems, incoming metals detection, and pass-through radiation detectors. Airlocks will be constructed to connect the existing SNM doors of the MAAs to the loading dock. The airlocks will be equipped with both alarm and assessment devices. An alarmed door will be provided at docks to interface with the SNM transfer vehicle. All SNM transfer vehicles will be modified such that they will become an integral part of the MAA during SNM transfers. Also, an enclosed loading dock and freight elevator will be constructed to provide secure access to the weapons material reclamation area.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-211

8. Brief physical description of project (contd.)

f. Upgrade central alarm system

Covers the procurement and installation of equipment and software modification to upgrade the central alarm system to provide a backup alarm system and video recording capabilities.

g. Harden protected area portals

This item covers construction of new hardened pedestrian and vehicular protected area portals including armor, gun ports, exit and entrance barriers, duress devices, and upgraded lighting.

h. Guard headquarters and emergency management center

Includes the demolition of an existing building and the relocation of its personnel into appropriate space and the construction of a guard headquarters facility consisting of an upper level with approximately 22,000 square feet to house the Y-12 security inspector force and related operations and a lower level garage area for protective forces patrol vehicles. This facility will contain offices, restrooms, change rooms for men and women, weapons and ammunition storage vault, conference and training areas, parking, exercise facilities, and a hardened enclosure for a central alarm station. The emergency management center, approximately 2,000 square feet, is a building addition to serve as an emergency management center during plant emergencies and will be the center of information and communications to insure adequate control of emergency situations.

The requested FY 1987 funds will be used for Title III engineering, equipment procurement, initiate construction of PIDAS system, personnel monitoring stations, MAA docks, and emergency management center.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide for upgrading of physical protection at the Y-12 Plant as required to meet current U.S. Department of Energy (DOE) threat guidance. Detailed evaluations of the safeguards posture of the Y-12 Plant, which were initiated in February 1982 with the assistance of Sandia National Laboratories and Lawrence Livermore National Laboratory, resulted in the identification of various weaknesses in existing systems. A number of "quick fixes" addressing weaknesses disclosed during these evaluations have been initiated utilizing available general plant project, capital equipment, and expense funds.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-211

9. Purpose, justification of need for, and scope of project (contd.)

Justification for each item included in the project is presented below.

a. Closure and control of Bear Creek Road

This is an "Official Use Only" road which parallels the north perimeter fence of the plant and runs near a major weapons production building housing a significant quantity of highly enriched uranium. The primary purposes of closure and control of this road are to provide the capability for containing or delaying adversaries attempting to leave the facilities in a land vehicle and to prevent easy access by adversaries to areas which are in close proximity to major production facilities housing a significant quantity of highly enriched uranium.

b. Guard towers

The towers will enhance the capability for early detection, assessment, and warning of approaching adversaries. The towers provide cover and a firing platform overlooking a major path of escape. A security inspector positioned in the tower can contain adversaries until a response team arrives. During an excavation of a nearby material access area, the security personnel within the tower can observe and initiate containment of exiting personnel.

c. Relocation of construction contractor

The present location of this contractor is operated as an "island" in the plant protected area and is accessible to uncleared workers, vendors, and other visitors. The protected area perimeter will also be straightened and shortened by eliminating this "island."

d. Perimeter intrusion detection/assessment system (PIDAS)

This system is necessary for effective detection of intruders attempting to gain access into the protected area.

e. Hardened personnel monitor stations and material access areas

The need for hardening of personnel monitor stations is to provide protection for the security inspector.

f. Upgrade central alarm station

This item is required to correct a number of current and potential problems with the existing system and its operation and to provide backup capability.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-211

9. Purpose, justification of need for, and scope of project (contd.)

g. Harden protected area portals

This item is required to protect the attending security inspector.

h. Guard headquarters and emergency management center

The guard headquarters facility is required to accommodate increases in the Y-12 security inspector force. The existing facility is inadequate for the current force, and this problem will become more critical with projected increases in the force. The Emergency Management Center is required to provide a site/facility where plant management, DOE personnel, and Federal, state, and local law enforcement agencies can manage plant emergencies. No existing facility exists which will handle these people and their activities. The proposed facility will be designed and equipped specifically for effective handling of emergencies.

Under the constraints of DOE security orders, currently there are no acceptable alternatives to this project as an entity or as a whole. Failure to provide the equivalent of this project will impose unwanted security risks.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 84-D-211

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 20 percent of construction costs, item b ..		$ 8,200
b. Construction costs		41,760
(1) Improvements to land including grading, landscaping, drainage, paving, and fencing..........	$ 500	
(2) Buildings		
(a) New and modified space to include items such as vaults, guard facilities, personnel monitoring station, and other related changes, approximately 25,600 square feet at about $182 per square foot	$ 5,000	
(b) DOE and construction contractor space, approximately 37,500 square feet at about $80 per square foot	3,000	
(3) Special facilities	32,760	
(4) Utilities, including electrical power, water, steam, and sanitary sewer lines	500	
c. Equipment		4,700
Subtotal		$54,660
d. Contingency at approximately 24 percent of the above costs		13,340
Total estimated cost		$68,000

11. Method of performance

To the extent feasible, design will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

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a/ Estimates based upon a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 84-D-211

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$20,200	$27,600	$16,900	$ 3,300	$68,000
Total facility cost	20,200	27,600	16,900	3,300	68,000
2. Other project funding					
(a) Conceptual design costs	200	0	0	0	200
Total other project cost	200	0	0	0	200
Total project costs (Items 1 and 2)	$20,400	$27,600	$16,900	$ 3,300	$68,200

b. Other related funding requirements (estimated life of project: 15 years)	
1. Facility operating costs	$ 1,924
2. Programmatic operating expenses directly related to the facility	7,696
Total other related annual funding requirements	$ 9,620

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project cost

(a) Conceptual design costs

Approximately $200,000 was required to prepare a conceptual design, preliminary schedule, and cost estimate for this project.

b. Other related funding requirements

1. Facility operating costs

Facility operating costs of $1,924,000 are projected to cover the cost of maintenance, utilities, and overhead for the project.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 84-D-211

13. Narrative explanation of total project funding and related funding requirements (contd.)

2. Programmatic operating costs

Programmatic operating costs estimated at $7,696,000 annually will cover the necessary manpower, materials, and overhead to support this project.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and site security upgrade, Pinellas Plant, Florida

2. Project No.: 84-D-212

3. Date A-E work initiated: 1st Qtr. FY 1985

3a. Date physical construction starts: 1st Qtr. FY 1986

4. Date construction ends: 1st Qtr. FY 1988

5. Previous cost estimate: $ 7,500
Date: 1/85

6. Current cost estimate: $ 7,500
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	$ 1,000	$ 0	$ 0	$ 0
1985	2,700	1,850	1,850	747
1986	3,800	4,650	4,650	3,253
1986 Sequestered	(0)	(280)	(280)	(0)
1987	0	1,000	1,000	3,000
1988	0	280	280	500

8. Brief physical description of project

This project provides for the construction of a new security/communications center which is necessary to enhance the safeguards and security at the Pinellas Plant. This project also includes procurement and installation of equipment to make the center operational and to upgrade site security which includes alarms, CCTV monitors, and security force vehicles. In addition, this project provides for construction of new site security roads, required drainage capability, a new 30,000-square foot parking lot, and truck trap for security at the northeast plant entrance.

The new facility will be one story, approximately 100 feet by 300 feet, with a gross area of approximately 30,000 square feet. The facility will be a combination of hardened and unhardened construction. The hardened construction will be concrete floors, walls and ceilings; unhardened construction will be concrete floors, masonry walls, structural steel framing, and metal roof deck. Utilities will be connected to the existing plant systems.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Pinellas Plant, Florida

2. Project No.: 84-D-212

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8. Brief physical description of project (contd.)

The facility will provide space to support the security operations which have expanded in size and scope of responsibilities. This space will provide for the following needs:

a. Change rooms, showers, restrooms, and break area for the increasing staff and provide separate rooms for men and women.

b. Training rooms to conduct demonstrations, lectures, and shift change briefings on an around-the-clock basis. This is attributed to the increased variety and depth of training coupled with the increased number of security inspectors.

c. Additional office space to accommodate the additions to the security professional and supervisory staffs.

d. Indoor firing range will permit day and night firing and will not restrict practice due to inclement weather. The range will also eliminate community concerns arising from the noise of gunfire and potential stray or ricocheting bullets associated with outdoor ranges.

e. A hardened communication center is required to house security alarm and monitoring hardware, expanded communications systems, and to permit centralized operator control.

f. An armory is planned to store the firearms of off-duty inspectors, as well as ammunition, extra firearms, and backup and auxiliary weapons. It is necessary to harden this facility to the point that such equipment cannot easily be seized by an intruder.

g. An exercise area to permit conditioning and controlled physical fitness testing of guard force personnel.

h. A technical security and countermeasures workshop/storage room for technical and electronic security equipment.

i. A garage area capable of housing armored and other security vehicles.

j. "Ready Room" to accommodate the large shift staffing and storage of response equipment.

It is necessary to control individual movement into, within, and out of the plant site. This facility will meet the requirements of the new security force, the need to house properly the increased security force, provide proper training facilities for the security force, and the need to replace outmoded security center equipment with state-of-the-art equipment. The need exists for: (1) a properly trained and equipped security force adequate to carry on the day-to-day control of

8. Brief physical description of project (contd.)

movement of people, vehicles, equipment, material, and classified information; and (2) a response capability that will detect, delay, and contain intruders.

The FY 1987 funding will fully fund the project and allow completion of construction of roads and parking area.

9. Purpose, justification of need for, and scope of project

Construction of this new building is required to provide the additional space needed as a result of the ongoing enhancement of Pinellas Plant security operations, expansion of the security force, and the increased tempo of security personnel training. Existing site facilities are inadequate to accommodate the intensified requirements and growth of the security force. Under current guidelines and requirements, failure to implement this project would result in significant curtailment of the mandated Pinellas Plant security enhancement. Approved site security requirements include the following items which relate to this new construction project:

a. The existing security guard force size must be approximately tripled.

b. The amount of onsite weaponry and ammunition must be increased.

c. The quantity of alarm, monitoring, and communication equipment must be increased.

d. Classroom and practical training sessions must be intensified for all security force personnel.

e. The amount of actual weapons firing training and evaluation must be increased for all security guards.

f. All security force personnel will be required to achieve and maintain Department of Energy (DOE) specified physical fitness standards for guard force members.

g. The security hardware and communication systems must be protected in hardened enclosures and provided with redundant support auxiliaries sufficient to ensure continuity of operation during emergency conditions.

h. The guard force must be located in such a manner as to facilitate rapid response to any area of the site.

New site roads are necessary to aid in response time to remote buildings and perimeter areas of the plant. These roads will help to increase surveillance capabilities at areas that become difficult to reach during the summer rainy season.

The new 30,000-square-foot parking lot will have room for approximately 100 cars. This lot will be used primarily for visiting law enforcement agencies personnel. Local supporting police and sheriff's departments will be able to utilize the

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Pinellas Plant, Florida

2. Project No.: 84-D-212

9. Purpose, justification of need for, and scope of project (contd.)

firing range. They will also be attending unclassified briefings and training sessions so as to familiarize them with site layouts and functions. These actions are necessary should the plant require their services in a crisis situation. This parking area will aid in the control of nonemployee vehicles within plant confines.

A truck trap will be designed and installed at the plant's northeast entrance. This trap is needed to prevent unauthorized entry by a speeding vehicle and would be the plant's first line of protection from such an occurrence.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 14 percent of construction costs, item b ..		$ 620
b. Construction costs		4,420
(1) Improvements to land	$ 762	
(2) Building	3,413	
(3) Utilities	245	
c. Standard equipment		1,295
Subtotal		6,335
d. Contingency at approximately 18 percent of above costs		1,165
Total estimated cost		$7,500

11. Method of performance

Design and engineering will be performed under an architect-engineer contract. Construction will be accomplished by fixed-price contract awarded on the basis of competitive bids and administered by the operating contractor. Standard equipment will be procured and installed by the operating contractor.

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a/ Based upon a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Pinellas Plant, Florida

2. Project No.: 84-D-212

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	Total
a. Total project costs				
1. Total facility costs				
(a) Construction line item	$ 4,000	$ 3,000	$ 500	$ 7,500
Total facility cost	4,000	3,000	500	7,500
2. Other project funding				
(a) Conceptual design costs	180	0	0	180
Total other project funding	180	0	0	180
Total project funding (Items 1 and 2)	$ 4,180	$ 3,000	$ 500	$ 7,680
b. Other related funding requirements				
1. Facility operating costs				$ 45
Total other related annual costs requirements				$ 45

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design costs

Approximately $180,000 is required to prepare the conceptual design.

b. Other related funding requirements

1. Facility operating costs

Facility operating costs of $45,000 are projected to cover the cost of maintenance and utilities for the project.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations

2. Project No.: 82-D-107

3. Date A-E work initiated: 1st Qtr. FY 1982

3a. Date physical construction starts: 2nd Qtr. FY 1982

4. Date construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: $1,247,000
Less prior projects: 211,000
Net cost estimate: $1,036,000
Date: 1/85

6. Current cost estimate: $1,257,475
Less prior projects: 211,000
Net cost estimate: 1,046,475 a/
Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1982	$ 87,500	$ 66,000	$ 65,899	$ 18,487
1983	132,900	154,400	154,405	71,584
1984	185,000	185,000	185,057	130,265
1985	165,000	163,754 b/	163,765	173,775
1986	170,000	160,500	160,500	165,778
1986 Sequestered	(0)	(8,250)	(8,250)	(0)
1987	153,400	116,900	116,900	145,088
1988	152,675	163,696	163,724	208,411
1989	0	44,475	44,475	133,087

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a/ The total project cost is estimated at $1,257,475,000 in FY 1987 dollars. The increased cost is due to escalation. Other restoration projects have been initiated which collectively have an estimated cost of $211,000,000 (FY 1980 Research, Development, and Testing (RD&T) capital equipment and Project numbers 79-7-n, 80-AE-6, 81-D-107, and 81-D-116). Therefore, the total estimated cost (TEC) of this line item project is $1,042,000,000 in FY 1987 dollars. The TEC assumes that adequate capital equipment and general plant project funding will be received in FY 1987 and future years to prevent the further deterioration of equipment and utilities in the nuclear weapons complex.

b/ Reflects management initiative reduction of $1,246,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations

2. Project No.: 82-D-107

8. Brief physical description of project

This project is a continuation of a multiyear program for restoration of utilities and capital equipment at the seven weapons production plants, the three weapons laboratories, and the Nevada Test Site. The project will provide for replacement of utilities and equipment that, in progressing at their normal life cycle, have deteriorated to the point that their physical condition is poor or is no longer technologically satisfactory. Appraisals of the physical condition and technological adequacy of utilities and equipment in use in the nuclear weapons production, research, development, and testing complex have been completed, and the complex has identified poor and inadequate items that should be replaced in order to meet current and future weapons program requirements. These utilities and equipment require correction due to (a) consistent substandard performance, (b) excessive maintenance costs, (c) continually threatening scheduled operations by breakdown, and (d) not being fully capable of meeting program requirements or performing at required confidence levels. These restoration efforts will be accomplished at the Y-12 Plant, Rocky Flats Plant, Bendix Plant, Mound Plant, Pantex Plant, Savannah River Plant, Pinellas Plant, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, and the Nevada Test Site.

The TEC increased by $6,000,000 with the application of the most current escalation rates, after accounting for changes to our planned funding schedule identified in the FY 1986 budget request.

The FY 1987 funding requested is $116,900,000: $79,100,000 will be used to continue design, procurement, and construction of utilities and equipment at the weapons production complex; $30,200,000 will be used to continue design, procurement, and construction of the critical utilities and equipment at the three weapons laboratories; and the remaining $7,600,000 will be used for restoration efforts at the Nevada Test Site.

9. Purpose, justification of need for, and scope of project

The Department of Energy (DOE) is responsible for the production and lifetime surveillance of safe and reliable nuclear weapons in support of United States national security. Thus, it is the mission of weapons production to provide for: (1) manufacturing capabilities and capacities required for the production of nuclear warheads, projectiles, and bombs approved by the President and planned for future enhancement of United States nuclear forces; (2) the surveillance and certification of the technical quality of nuclear weapons in the existing stockpile; (3) the provisioning of limited-life components; and (4) reviewing jointly with the Department of Defense (DOD) the safety of operating and handling procedures. During the 1980's, the annual workload for this mission is greater than the workload experienced in the late 1970's.

The primary missions of the DOE's nuclear weapons RD&T activities are: (1) to sustain international leadership in new ideas and technologies essential to maintain modern nuclear forces capable of responding to threats against the United States national security; and (2) to design, develop, and certify nuclear weapons approved by the President for DOD delivery systems.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations
2. Project No.: 82-D-107

9. Purpose, justification of need for, and scope of project (contd.)

Concern has developed at the Office of Military Application and field operations offices over the past few years that the nuclear weapons production, laboratory, and testing facilities have deteriorated to such a condition that the probabilities of failures that could cause production stoppages have increased to the point that planned workloads and schedules for the 1980's may not be met. Further, the deterioration of the laboratory and testing facilities increases the risk of diminishing the United States superiority in nuclear weapons technology.

During calendar years 1977 and 1978, members and staff of the Senate Armed Services Committee (SASC) and the House Armed Services Committee (HASC) made extensive visits to nuclear weapons production, research, development, and testing facilities. They recognized that a deficiency in production facilities and the research and development laboratories had built up over the years. It was observed further that, while this problem was acknowledged, there was no comprehensive program designed to alleviate the problem systematically. Chairman Price of the HASC, in a letter to Dr. Schlesinger on January 6, 1978, requested further information on existing studies, budget history, estimated total cost to replace obsolete equipment and utilities, a reasonable estimate for replacement costs, and DOE plans to restore such deficiencies. A SASC staff member's report to Chairman Stennis on his inspection of DOE weapon facilities was instrumental in the FY 1979 authorizing legislation requirement that the Secretary of Energy conduct a study of the status of all Government-owned, contractor-operated plant, capital equipment, facilities, and utilities which support the United States nuclear weapons program; and to submit the results of such a study to the Congress at the same time the DOE authorization request for FY 1980 was submitted to the Congress.

Recognizing that a problem existed, a study was initiated in early CY 1977 to determine the extent of deterioration of equipment and utilities at the nuclear weapons production plants prior to the increased workload expected in the 1980-87 time period. The results were issued in a report dated November 1, 1977, entitled "An Appraisal of Physical Condition and Technology Status of Equipment and Utilities Systems in the Weapons Production Complex." This appraisal formed the basis for determining an estimate of $300,000,000 to be the net accumulated degradation in FY 1980 in the production and surveillance complex.

In December 1977, a similar appraisal was initiated to determine the status of equipment and utilities at the nuclear weapons laboratories and the Nevada Test Site. The research, development, and testing study concluded that the cost of equipment and utilities which need replacement to assure an efficient and capable complex to perform nuclear weapons research, development, and testing amounted to approximately $295,000,000 in FY 1980 dollars. Thus, the total estimate of upgrading the whole weapons complex was stated as $595,000,000 in FY 1980 dollars. Subsequent to these appraisals, the DOE Controller was tasked to conduct an independent assessment of the appraisals. This assessment primarily concluded that: (1) degradation in the weapons complex was serious, (2) the appraisal method was technically sound, (3) some of the samples contained excess equipment that should have been purged prior to determining the estimated cost of replacement, and (4) the replacement cost was used when less costly alternatives existed for upgrading the capability. The Controller's estimate, based on these findings, was $451,000,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations

2. Project No.: 82-D-107

9. Purpose, justification of need for, and scope of project (contd.)

On January 25, 1979, the Assistant Secretary for Defense Programs provided a report to the Congress on the results of the studies. As part of this study, the DOE proposed to undertake the correction of these deficiencies with a multifaceted program over the next several years. This included: (a) annual appraisals of the technical and physical status of the United States nuclear weapons capability and the progress being made to correct the existing deficiencies, (b) improving the precision of the appraisal techniques, and (c) developing annual funding requirements through the normal budgetary procedures as part of a multiyear restoration program.

The second appraisal of the nuclear weapons complex indicated that the condition of the complex continued to deteriorate and that the accumulated degradation had grown to $790,000,000 in FY 1981 dollars. This increase over the previous estimate was caused primarily by four factors: (1) engineering-type estimates for repair or replacement costs were used rather than estimates based on Bureau of Labor Statistics escalation indices; (2) inclusion of the appraisal of interior building services at all sites; (3) an additional year's degradation from the previous appraisal; and (4) an additional year's escalation on the restoration costs for those items found to be physically poor or technologically inadequate. As was done for the first appraisal, the Controller conducted an independent assessment of the appraisals. The Controller's assessment once again verified the seriousness of the degradation in the weapons complex and that the relative growth in the estimate was justified. However, the Controller's estimate for the accumulated degradation was $674,000,000 in FY 1981 dollars.

Three appraisals have now been completed and indicated the problem had grown to $969,000,000 in FY 1982 dollars. Although the Controller's office did not conduct a third independent assessment, a comparable estimate of $847,000,000 was developed utilizing the results of the Controller's second assessment; estimating the amount of additional deterioration, including the higher escalation rates being experienced; and expressing this estimate in FY 1982 dollars. Allowing for the additional deterioration continuing to be experienced due to the continued underfunding of capital equipment and general plant projects and expressing the Controller's estimate in FY 1987 dollars yields a current estimate of $1,265,400,000. The DOE now proposes an eight-year program for the correction of the identified production and testing complex deficiencies, and a nine-year funding program for the research and development complex. The funding requested for this project is a part of that program.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations

2. Project No.: 82-D-107

10. Details of cost estimate a/

	Total cost
a. Engineering, design, and inspection	
b. Construction costs	
(1) Building modifications	
(2) Special facilities	
(3) Utilities	
c. Standard equipment	$1,046,475
d. Removal cost less salvage	
e. Contingency	
Total estimated cost	$1,046,475 b/

11. Method of performance

Design and inspection will be performed under negotiated architect-engineer contracts and by operating contractors. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	$559,889	$145,088	$208,411	$133,087	$1,046,475
Total facility costs	559,889	145,088	208,411	133,087	1,046,475
2. Other project funding					
(a) Conceptual design costs	3,311	0	0	0	3,311
(b) Other project related costs	550	100	0	0	650
Total other project funding	3,861	100	0	0	3,961
Total project funding (items 1 and 2)	$563,750	$145,188	$208,411	$133,087	$1,050,436

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a/ Based on completed third appraisal and Controller's second assessment.

b/ Excludes prior-year projects estimated at $211,000,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations

2. Project No.: 82-D-107

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
  - 1. Total facility costs
    - (a) Construction line item

      Total excludes prior-year projects estimated at $211,000,000.
  - 2. Other project funding
    - (a) Conceptual design

      Conceptual design cost of $3,311,000 is necessary to develop a budget quality cost estimate and construction schedule.
    - (b) Other project related costs

      $650,000 is required for Rocky Flats' subprojects for health physics monitoring.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: 155mm Artillery fired atomic projectile (AFAP) production facilities, Various Locations
2. Project No.: 82-D-109
3. Date A-E work initiated: 1st Qtr. FY 1982
3a. Date physical construction starts: 1st Qtr. FY 1982
4. Date construction ends: 4th Qtr. FY 1988
5. Previous cost estimate: $40,000 Date: 1/85
6. Current cost estimate: $40,000 Date: 1/86

7. Financial schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1982	$ 35,000	$ 15,000	$ 14,850	$ 1,726
1983	0	0	149	5,785
1984	0	0	1	3,772
1985	50,000 a/	0	0	2,754
1986	0	15,000	15,000	6,000
1987	0	10,000	10,000	9,000
1988	0	0	0	10,963

8. Brief physical description of project

This project will provide additional equipment, building modifications, and special facilities needed for production and certification of components, subassemblies, and final assembly of the W82 warhead for the new 155mm artillery fired atomic projectile.

Production of the new 155mm AFAP requires revised or expanded capabilities at various production plants. Following are examples of equipment and facility modifications that are expected to be provided under this project: (1) equipment for manufacturing the high strength projectile case and nuclear components; (2) equipment for grinding, joining, and plating

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a/ The Department of Energy's National Security and Military Applications of Nuclear Energy Authorization Act of 1985, Section 1635(a), provides authorization of $50,000,000 after September 30, 1984, for the construction of facilities necessary to produce the 155mm AFAP.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: 155mm Artillery fired atomic projectile (AFAP) production facilities, Various Locations

2. Project No.: 82-D-109

8. Brief physical description of project (contd.)

projectile components; (3) facilities for fabrication and assembly, inspection, testing, and certification of projectile component subassemblies and final assemblies; (4) minor building additions for housing environmental and testing equipment; (5) building modifications necessary to accommodate new equipment and process installations; and (6) equipment for machining.

Utilities will be provided by extension of existing services within existing buildings.

Existing weapon production plants that will require building modifications or new equipment installations include the Bendix Plant, Kansas City, Missouri; the Pantex Plant, Amarillo, Texas; and the Y-12 Plant, Oak Ridge, Tennessee.

The requested FY 1987 funding will complete this project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide new capabilities and additional production capacity needed to meet established production requirements for the W82 warhead.

Maximum use will be made of existing manufacturing capabilities and capacities in preparing for production of the 155mm AFAP. However, unique features of the new weapon will require capabilities not currently available in the production plants. The additional number of parts added to the production workload will require additional capacity at the production plants.

The new 155mm AFAP will be designed with improved firing characteristics and extended range and will replace the existing W48 projectile. This agency and the Department of Defense agreed to Phase 3 development engineering activities in February 1978.

The projectile size (6.2 inches diameter) and the severe gun-firing environments will require difficult processing methods to further miniaturize components and to ensure that the components meet design specifications.

Manufacturing and process uncertainties that remain to be resolved by the production complex to ensure design specifications are met include machining a critical structural feature within the projectile. Provision is made in the cost estimate for these and other unresolved minor manufacturing and process uncertainties.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: 155mm Artillery fired atomic projectile (AFAP) production facilities, Various Locations

2. Project No.: 82-D-109

10. Details of cost estimate a/

	Item Cost	Total Cost
a. Engineering, design, and inspection at approximately 33 percent of construction costs, item b		$ 6,000
b. Construction costs		18,000
(1) Special facilities	$18,000	
c. Standard equipment		12,777
Subtotal		$36,777
d. Contingency at approximately 5 percent of above costs		1,700
e. Production process uncertainties		1,523
Total estimated cost		$40,000

The estimates by location are as follows:

	Total Cost
Bendix Plant, Kansas City, Missouri	$ 9,100
Pinellas Plant, St. Petersburg, Florida	1,100
Pantex Plant, Amarillo, Texas	2,500
Rocky Flats Plant, Golden, Colorado	9,600
Mound Plant, Miamisburg, Ohio	6,577
Y-12 Plant, Oak Ridge, Tennessee	7,900
Contingencies and process uncertainties	3,223
Total	$40,000

11. Method of performance

Design and inspection will be performed under negotiated architect-engineer contracts and by the operating contractors. To the extent feasible, procurement and construction will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

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a/ Estimate based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: 155mm Artillery fired atomic projectile (AFAP) production facilities, Various Locations

2. Project No.: 82-D-109

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1987	FY 1988	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	$20,037	$ 9,000	$10,963	$40,000
Total facility cost	$20,037	$ 9,000	$10,963	$40,000
2. Other project funding				
(a) Conceptual design	120	0	0	120
Total other project funding	120	0	0	120
Total project funding (items 1 and 2)	$20,157	$ 9,000	$10,963	$40,120

b. Other related funding requirements (estimated life of project: 10 years)

1. Facility operating costs	$ 3,500
2. Programmatic operating expenses directly related to the facility	11,650
Total other related annual funding requirements	$15,150

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding
   1. Other project funding
      (a) Conceptual design

Conceptual design costs of approximately $120,000 were incurred in the process of developing and improving the project cost estimate and schedule.

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 10 years.

1. Facility operating costs

Facility operating costs of approximately $3,500,000 per year are projected to cover the costs of utilities, maintenance, janitorial services, and related overhead.

1. Title and location of project: 155mm Artillery fired atomic projectile (AFAP) production facilities, Various Locations

2. Project No.: 82-D-109

13. Narrative explanation of total project funding and other related funding requirements (contd.)

2. Programmatic operating expenses directly related to the facility

Programmatic operating costs of approximately $11,650,000 per year are projected to cover the direct labor, material and supplies, tooling procurement, tooling fabrication, and related overhead.

Materials Production

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
MATERIALS PRODUCTION
Atomic Energy Defense Activities

(Tabular dollars in thousands. Narrative material in whole dollars.)

Materials Production (DP)	FY 1985 Approp.	FY 1986 Adjusted Approp. i/	FY 1987 Base	FY 1987 Request	Request Vs. Base
Operating Expenses					
Reactor Operations	$ 509,241 c/	$ 541,098	$541,098	$ 616,660	$ 75,562
Processing of Nuclear Materials	432,870	464,832	464,832	499,830	34,998
Supporting Services	275,985	249,946	249,946	252,500	2,554
Enriched Material	142,800	169,600	169,600	204,500	34,900
Program Direction	19,980 a/b/	22,276 b/g/	22,276	22,900	624
Subtotal Operating Expenses	$1,380,876	$1,447,752 f/h/	$1,447,752 f/h/	$1,596,390	$148,638
Capital Equipment	104,157 c/d/	109,540	109,540	126,090	16,550
Construction	260,302 d/	214,265 e/g/	214,265	343,666	129,401
Reduction from Prior Year Unobligated Construction Projects	0	-3,408	-3,408	0	3,408
Total Materials Production	$1,745,335	$1,768,149	$1,768,149	$2,066,146	$ 297,997
Full-Time Equivalents (FTE's)	327	337	337	348	11
Headquarters	52	48	48	48	0
Savannah River	275	289	289	300	11

Authorization: Section 31, P.L. 83-703

a/ Reflects comparability adjustment reduction of $297,000 and 5 FTE's in FY 1985 for the transfer of environmental, safety, and quality assurance functions to Weapons Activities Program Direction due to reorganization.

b/ Reflects comparability adjustment reduction of $23,000 and one FTE in FY 1985 and $24,000 and one FTE in FY 1986 for the transfer of the Materials Production mailroom function to Military Application program direction due to reorganization.

c/ Reflects recission of $995,000 in accordance with Section 2901, Public Law 98-369. The allocation of this reduction is $394,000 operating expenses and $601,000 capital equipment.

d/ Reflects reduction of $1,402,000 capital equipment and $4,198,000 construction for distribution of FY 1985 management savings.

e/ Reflects a proposed transfer appropriation reduction of $634,000 to Departmental Administration for general FTE clerical reduction.

f/ Reflects a reduction of $5,675,000 in FY 1986 and $4,200,000 in FY 1987 as Materials Production's share of Management Savings initiatives for the Atomic Energy Defense Appropriation.

g/ Reflects $1,000,000 proposed reprogramming for pay cost restoration in FY 1986. Funds are provided from prior year construction projects.

h/ Reflects proposed appropriation transfer reduction of $1,517,000 to the Energy, Supply Research and Development Appropriation for FY 1986 environmental assessment activities.

i/ Reflects $92,651,000 sequestered to comply with the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).

Department of Energy
FY 1987 Congressional Budget Request
Adjustments to FY 1986 Appropriations

Materials Production (DP)	FY 1986 Confer.	General Reduction	Pay Cost Restoration	FTE General Reduction	Gramm-Rudman-Hollings	ES&H Transfer/ Reprogramming	Subtotal	Comparability Adjustments	Adjusted Approp. Total
Operating Expenses									
Reactor Operations	$ 576,380	$ -5,675	$ -	$ -	$-28,090	$ -1,517	$ 541,098	$ -	$ 541,098
Processing of Nuclear Materials	483,145	-	-	-	-18,313	-	464,832	-	464,832
Supporting Services	256,575	-	-	-	-6,629	-	249,946	-	249,946
Enriched Material	184,000	-	-	-	-14,400	-	169,600	-	169,600
Program Direction	21,300	-	+1,000a/	-	-	-	22,300	-24	22,276
Subtotal, Operating Expenses	1,521,400	-5,675	+1,000	-	-67,432	-1,517	1,447,776	-24	1,447,752
Capital Equipment	121,440	-	-	-	-11,900	-	109,540	-	109,540
Construction	225,810	-	-1,000	-634	-11,545	-	212,631	-	212,631
Subtotal, Materials Production	1,868,650	-5,675	0	-634	-90,877	-1,517	1,769,947	-24	1,769,923
General Reduction:									
Operating Expenses	-5,675	+5,675	-	-	-	-	-	-	-
Capital Equipment	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-
Total, General Reductions	-5,675	+5,675	-	-	-	-	-	-	-
FTE Reduction	-634	-	-	+634	-	-	-	-	-
Use of Prior Year Balances (Materials Prod.)									
Operating Expenses	-	-	-	-	-	-	-	-	-
Capital Equipment	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-1,774	-	-1,774	-	-1,774
Total, Prior Year Bal. (Materials Prod.)	-	-	-	-	-1,774	-	-1,774	-	-1,774
Total, Materials Production	$1,862,341	$ 0	$ -	$ 0	$-92,651	$ -1,517	$1,768,173	$ -24	$1,768,149
Operating Expenses	1,515,725	-	+1,000	-	-67,432	-1,517	1,447,776	-24	1,447,752
Capital Equipment	121,440	-	-	-	-11,900	-	109,540	-	109,540
Construction	225,176	-	-1,000	-	-13,319	-	210,857	-	210,857

a/ Proposed reprogramming to cover pay cost absorption.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES
Materials Production
(in thousands of dollars)

FY 1986 Adjusted Appropriation/FY 1987 Base		$1,768,149
Program increases and decreases:		
Operating Expenses		
Reactor Operations		
Increase for escalation of reactor operations operating expenses	+	27,160
Increase at the Fernald Feed Materials Production Center to supply the uranium requirements for fuel elements for the Richland and Savannah River reactors and for phase-in of Westinghouse as the new contractor at Fernald	+	11,085
Increase at Richland for fabrication and irradiation, maintenance, second year funding for the productivity retention program, and for the Production Assurance Program to insure long-term supply of nuclear materials	+	13,634
Increase at Richland for environmental, safety, and health activities	+	3,270
Increase at the Savannah River Plant for fuel fabrication and irradiation	+	6,798
Increase at the Savannah River Plant for essential reactor maintenance to continue operations	+	10,905
Increase at the Savannah River Plant for security	+	2,710
Processing of Nuclear Materials		
Increase for escalation of processing of nuclear materials operating expenses	+	23,220
Decrease at Los Alamos to reflect the transfer of some of weapon-grade plutonium processing efforts to other locations	-	11,365
Increase at Idaho for continued processing of Naval fuels and for the Idaho restoration project for replacement of deteriorating DOE facilities.	+	3,982
Increase at Oak Ridge for the recovery of nonspecification enriched uranium and for the processing of californium-252	+	1,565
Increase at Richland for advanced planning and technology, facility maintenance, and improved security	+	9,375
Increases Special Isotope Separation process technology development efforts with option for future deployment	+	1,100
Increase at San Francisco for fuel decladding activities	-	1,080
Increase at the Savannah River Plant for increased fuel separation, processing of L Reactor materials, and other materials processing	+	8,201

SUMMARY OF CHANGES (continued)

Supporting Services

Increase for escalation of supporting services operating expenses........	+	12,505
Decrease in process development activities at Los Alamos	-	3,359
Decrease in startup costs at Idaho	-	942
Increase at Oak Ridge for rewinding electrical motors at the Portsmouth Gaseous Diffusion Plant, standby support for the Oak Ridge Gaseous Diffusion Plant, weapon program support, and for feasibility and engineering studies..	+	4,007
Increase at Richland primarily for continued support for the Process Facility Modifications project.................................	+	3,085
Decrease at San Francisco for termination of Plasma Separation Process development	-	26,000
Increase at the Savannah River Plant for process development to support production operations; reactor safety analyses and safety developmental support; robotics development; process spares; conceptual engineering; change in inventories, etc......................	+	8,798
Increase at the Savannah River Plant for security activities	+	4,460

Program Direction

Increase in program direction funding to support 11 additional full-time equivalents..	+	624

Enriched Material

Increase for N Reactor separative work requirements	+	5,300
Increase for Naval Reactors separative work requirements	+	29,600

Capital Equipment

Increase for escalation of capital equipment	+	5,605
Decrease at Albuquerque to reflect the need for equipment at other materials production facilities	-	1,411
Decrease at Idaho in the need for equipment for environmental, restoration, and security activities	-	310
Increase at Oak Ridge for weapons support at Y-12, for essential replacement equipment at Fernald to ensure continued supply of feed materials to the reactors, and for improved environmental activities	+	13,100
Increase at Richland for reactor operations, security support, Production Assurance process tube replacement activity, etc.	+	7,121
Decrease at the Savannah River Plant in the need for essential equipment to continue uninterrupted operation of the fuel fabrication, production reactor, and processing facilities	-	3,570
Decrease at San Francisco for the Special Isotope Separation development program	-	3,985

Construction

Net increase in funding for prior year projects, various locations.......	+ 7,131
Reduction from prior year unobligated construction projects.............	+ 3,408
Increase for five new environmental projects, including two new projects at Richland, two new projects at the Savannah River Plant, and one new project at Fernald	+ 23,650
Increased funding to return the Idaho Fuel Processing Facility Restoration (Project 85-D-139) to the minimum level needed to allow continuation of design activities and to initiate long-lead procurement and limited construction activities	+ 21,470
Increase in funding to continue project for expansion and modification to existing fuel processing capabilities at Richland (Project 84-D-135) .	+ 20,525
Increase to continue the program to provide for upgrading of aging facilities and retention of production capabilities at Fernald, Richland, and the Savannah River Plant (Project 86-D-149)	+ 56,625
FY 1987 Request	$ 2,066,146

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
Materials Production
(Tabular dollars in thousands. Narrative material in whole dollars)

Program Overview

The Materials Production program provides nuclear materials to meet near-term national defense and nondefense requirements. In addition, Materials Production sustains a base production program capable of meeting long-term nuclear materials production requirements consistent with the annual Presidential Nuclear Weapons Stockpile Memorandum and the annual Department of Energy (DOE) Materials Management Plan.

The requirements for nuclear materials are based on the stockpile projections contained in the proposed FY 1986-1991 joint DOE/Department of Defense Nuclear Weapons Stockpile Memorandum. Most of the nuclear materials needed for new weapon systems are obtained from retired weapons. However, production of additional nuclear material is required over the next decade to meet stockpile requirements.

DOE's presently programmed production capability includes the four operating production reactors at the Savannah River Plant; N Reactor at Richland, Washington; and blending fuel-grade plutonium with high-purity plutonium specially produced in the Savannah River reactors.

The specific objectives of the Materials Production Program are:

- Provide nuclear materials for National Defense requirements and for allies under mutual defense agreements;
- Provide nuclear materials for departmental reactor research and development programs, other government agencies, industry, and foreign governments under civilian agreements for international cooperation;
- Receive and process nonproduction reactor fuels (e.g., Naval propulsion, research, and materials testing reactors) for recovery of plutonium, enriched uranium, and other materials;
- Make available sufficient N Reactor byproduct steam to the Washington Public Power Supply System to generate electricity for the Bonneville Power Administration power grid;
- Recycle nonspecification nuclear materials to recover valuable materials, minimize storage costs, and conserve materials and energy;
- Maintain operational capability to meet nuclear material needs;
- Conduct all nuclear materials production related activities in a safe, secure, environmentally-acceptable, energy-efficient and cost-effective manner and in accordance with Departmental environmental protection, safety, health protection and quality assurance orders and directives; and
- Maintain technical capability to develop process improvements and improved production operations technology.

In addition to these production objectives, DOE plans to utilize available capacity in its Nuclear Materials Production facilities to assist the Office of Military Applications in recovering plutonium from the backlogged inventory of residues and nonspecification plutonium generated in weapon production operations.

Operations

The Materials Production program operates a reactor feed material production complex; production reactors at the Savannah River Plant and Richland; spent fuel and target chemical processing plants at the Savannah River Plant, Richland, and Idaho; and support facilities integral to the operation of the facilities mentioned above. These facilities are unique to the production of nuclear materials for defense purposes. There is no cost effective alternative production method within the United States, at present or within the production planning period, for providing the nuclear materials required by the national defense program, other Federal programs, and industry.

The Oak Ridge Y-12 Plant processes highly-enriched uranium that is recovered from spent Naval and research reactor fuels at Idaho or uranium recovered at the Savannah River Plant from spent production or research reactor fuels. This enriched uranium is then shipped to the Savannah River Plant where it is alloyed with aluminum and fabricated into fuel tubes for subsequent reactor charging with enriched lithium targets for tritium production or depleted uranium targets for plutonium production. The irradiated enriched uranium fuel is processed at the chemical processing plant at the Savannah River Plant for recovery and recycle of the remaining enriched uranium.

At Fernald, Ohio, depleted uranium is processed into metallic uranium and cast into cylinders. These castings are shipped to Ashtabula, Ohio, for extrusion into long rods. These rods are returned to Fernald for manufacturing into target cores. The uranium cores are shipped to the Savannah River Plant, clad with aluminum and prepared for loading into the Savannah River Plant reactors. After irradiation within the reactor, targets are stored temporarily in onsite facilities prior to being processed in the Savannah River Plant's chemical processing plant to recover plutonium and tritium for weapons use. Other reactor products used for defense, research, medical and commercial applications are also recovered during the processing operation.

The N Reactor at Richland uses slightly-enriched uranium fuel to power the reactor and to provide steam to the Washington Public Power Supply system for electricity generation. To obtain fuel for the Richland reactor, slightly enriched uranium is converted to metal and cast into ingots at the Fernald plant, extruded into cylindrical billets at Ashtabula, Ohio, and shipped to the fuel fabrication facilities at Richland, Washington. The billets are clad with zirconium and extruded to provide finished fuel elements for the reactor. After irradiation within the reactor, the spent fuel is removed and temporarily stored onsite prior to being processed in the Richland PUREX fuel processing plant.

Spent reactor fuel from naval and research reactors is processed at the Idaho Fuel Processing Facility within the Idaho National Engineering Laboratory at Idaho Falls, Idaho.

Safeguards and Security

The FY 1987 request provides for continued attention to DOE safeguards and security activities. Construction activities increase by $12,484,000 in FY 1987 compared to FY 1986 due to increased design, procurement, and construction activities needed to maintain project schedules. Third year funding of $14,650,000 is requested for the Plantwide Safeguards and Security Improvements project (84-D-134) at the Savannah River Plant to prevent and detect the diversion and/or theft of special nuclear material. Facility improvements are also directed toward prevention of radiological and industrial sabotage, as well as to deny unauthorized access to equipment, material and sensitive information. Second year funding of $13,900,000 is requested for the Plantwide Safeguards Systems project (86-D-156) for the Savannah River Plant that will provide upgrades to broad areas of physical security alarm systems, personnel/vehicle access controls, and special nuclear material accountability. The total FY 1987 request for safeguards and security is $159,335,000, an increase of $26,006,000 over FY 1986.

The safeguards and security budget for FY 1987 has been formulated as part of an agency-wide effort to continue efforts to correct remaining deficiencies and establish effective systems. The safeguards and security program is essential for continuation of the Nuclear Materials Production Program, the protection of public health and safety, and national security.

The revised threat guidance, inspections, and investigations have produced an immediate need for increased funding to improve the safeguards and security of key facilities and nuclear materials.

Environmental Support

The FY 1987 request provides funds for environmental activities at the Savannah River Plant including: (1) elimination of the potential for future contamination of ground and surface waters from radioactive and hazardous industrial waste discharges; (2) expanded monitoring, evaluation and cleanup of existing ground water contamination; (3) engineering studies to deactivate and decontaminate the chemical separations area seepage basins; and (4) thermal mitigation of reactor discharges. These activities are consistent with the Groundwater Protection Plan for the Savannah River Plant, which was submitted by the Department to Congress in FY 1984 pursuant to Public Law 98-181. The requested funding is required to implement the Ground Water Protection Plan, to conduct planned environmental evaluations, and to define and undertake mitigation actions, consistent with DOE consent orders with the State of South Carolina.

Funds are requested to initiate environmental activities at Richland that will address and resolve problem areas that have been receiving increased public, State and Federal Government attention. To comply with agreements with the State of Washington, DOE must take the steps necessary to reduce chemical discharges to the process sewers at the fuel fabrication facility. In addition, to comply with DOE order requirements, the design of a facility to process radioactive effluent from N Reactor must be initiated to eliminate discharges to the ground as soon as possible.

Funds are also requested to continue activities at the Fernald and Ashtabula, Ohio, fuel fabrication sites to resolve environmental problems that have been receiving increased public, State, and Federal Government attention.

Funds are included both in FY 1986 and in FY 1987 for Atmospheric Release Advisory Capability services.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Materials Production	$1,768,149	$2,066,146
I. Operating Expenses	$1,447,752	$1,596,390
A. Reactor Operations	$ 541,098	$ 616,660

The FY 1987 request for reactor operating expenses provides for necessary operation of production reactor feed plants at Fernald and Ashtabula, Ohio, and Oak Ridge, Tennessee; N Reactor, fuel fabrication and support facilities at Richland, Washington; and four production reactors (P, K, C, and L), fuel fabrication and support facilities at the Savannah River Plant near Aiken, South Carolina.

Of the increase in reactor operations, $27,160,000 is for escalation, and $48,402,000 is for programmatic activities.

Oak Ridge

The FY 1987 request at Oak Ridge is $11,085,000 above the FY 1986 adjusted appropriation. The increase will provide the necessary level of fuels for the Richland and Savannah River reactors and reflects the Department's attention to environmental problems at Fernald and Ashtabula, Ohio.

In FY 1987, slightly-enriched uranium billets will be produced for the Richland N Reactor to support the weapon-grade plutonium production mode, an increase over FY 1986 deliverables which were decreased by a labor strike action. The Fernald, Ohio, Feed Materials Production Center (FMPC) and the Ashtabula, Ohio, Extrusion Plant will deliver uranium for the Savannah River Plant Mark 16/31 cores in FY 1987 to support reactor operations.

Also, the Fernald FMPC will make a significant number of improvements in air filtration systems, water pollution controls, worker health and safety related upgrades, and in environmental monitoring equipment to satisfy a DOE public commitment to improve conditions at the FMPC that have recently drawn adverse national attention. Additionally, a new site contractor will take over during FY 1986 and will significantly increase staffing levels in the areas of safety, health, and environment.

At the Oak Ridge, Tennessee, Y-12 Plant in FY 1987, highly enriched uranium from nonproduction fuels processed at the Idaho Fuel Processing Facility and highly enriched uranium from production fuels processed at the Savannah River Plant are to be converted to metal form for reuse as fuels in the Savannah River Plant production reactors and for use in the weapons program. This recycle of recovered highly enriched uranium conserves virgin highly enriched uranium recovered from recycled weapons and held in DOE material inventories. Highly enriched uranium metal will be shipped to the Savannah River Plant to support reactor operation.

Richland

An additional $16,904,000 over planned FY 1986 funding is requested in FY 1987 for Richland. Of the increase, $3,270,000 is for environmental, safety and health activities. The remainder of the request is for N Reactor operations, plant maintenance, productivity retention project support, and for production assurance activities.

The Richland N Reactor will produce weapon-grade plutonium in FY 1987. The facility will generate about 700 kilomegawatt days of thermal energy and will also deliver byproduct steam to the Washington Public Power Supply System to generate up to 3.6 billion kilowatt-hours of electricity for the Bonneville Power Administration power grid. Steam revenues for FY 1987 are expected to be about $54,400,000.

In support of N Reactor operations, the Richland fuel fabrication facility will produce finished fuel.

In FY 1987, Richland will continue a program at an operating expense level of $3,500,000 to develop improved reactor refueling capability for increased charge/discharge safety and greater operational efficiency. Reactor maintenance activities will be supported at a level required to preserve productivity reestablished by the restoration project in order to continue the mission of the reactor production facilities into the 1990's.

Funds are provided in the amount of $12,100,000, to support Production Assurance activities for planning, design, plant and reactor systems surveillance and evaluation, technology and fabrication development, and engineering and equipment development. These activities are essential to prepare for replacement of several hundred reactor process tubes that current studies indicate will, during the 1990's, be unacceptable for operation from embrittlement and/or distortion. Failure to replace these tubes beginning in FY 1990 may result in a significant loss of reactor production. These funds also support continued and expanded surveillance, evaluation, development, and planning efforts that address graphite rehabilitation and balance-of-plant upgrades that are essential if the life of N Reactor is to be extended beyond the mid-1990's.

A reactor decontamination that is performed every 2 to 3 years will be conducted for $600,000. Irradiated fuel handling equipment improvements will be achieved for $600,000 to realize cost, exposure, and throughput efficiencies.

Savannah River Plant

The FY 1987 request at Savannah River is $20,413,000 above the FY 1986 adjusted appropriation. These funds will be used to fund increased reactor fuel fabrication and irradiation, a backlog of maintenance, security, and reactor safety.

At the Savannah River Plant, reactor operations consist of all activities directly attributable to the production of nuclear materials in a reactor. The four reactors (P, K, C, and L) will produce weapon-grade plutonium and tritium for the nuclear weapons program, plutonium-238 for both weapons and space applications, and other nuclides for medical and industrial requirements. Within reactor operations, major activities include fuel and target fabrication, irradiation, and reactor safety.

The fuel fabrication facilities produce all the fuel and target elements needed for the Savannah River Plant reactors. Raw materials such as lithium, uranium, neptunium oxide, and aluminum go through various metal working operations such as casting, machining, plating, extruding, and welding as well as inspection operations to produce fuel and target elements for the reactors. Nearly 275,000 slugs, housings, control rods, fuel tubes and target tubes are produced annually by approximately 300 employees. In FY 1987, these facilities will produce fuel and target elements in support of tritium and plutonium production in the reactors. This budget request supports all costs (material, labor, and overhead) associated with operating and maintaining these facilities.

The fuel and target elements shipped to the reactor areas will be irradiated in the four operating reactors to produce weapon-grade plutonium, tritium, Pu-238 and other nuclides. These facilities are also responsible for final assembly of fuel, target, and control rod elements prior to irradiation, for storage of the highly radioactive fuel and target assemblies following irradiation, and disassembly/bundling of tubes and slugs in preparation for shipment to the separation areas for processing. Approximately 1,200 employees are involved in the operation and maintenance of these facilities.

It is projected that four reactors will be operating during FY 1987. The Mark 31 plutonium assemblies discharged will contain a nominal Pu-240 content of about 4.5 percent to support the blending program. Mark 53 assemblies will be irradiated as necessary to produce Pu-238 for defense and research purposes. The operating philosophy is that tritium producing charges will be used to meet tritium requirements first with the balance of the capacity allocated to plutonium production.

The FY 1987 operating expense request includes sufficient funding to operate and maintain both the reactor and fabrication facilities. Programmatic requirements include funding for four reactor operation, maintenance, training, security guards, and contractual commitments.

The reactor safety and reliability program encompasses activities identified in various safety assessments subsequent to the Three Mile Island accident. These include training of reactor operator and supervisory personnel, operating reactor simulators, engineering safety studies, and studies of ways the Department can profit from the lessons the accident taught the nuclear industry. The FY 1987 operating request supports reactor operator and supervisor training, personnel to support the reactor simulator, nondestructive testing of reactor internals, and engineering development of the reactor safety equipment and facilities.

	FY 1986 Adjusted Appropriation	FY 1987 Request
B. Processing of Nuclear Materials	$464,832	$499,830

The FY 1987 request for operating expenses for nuclear materials processing is required to assure that resources are available to meet continuing nuclear materials defense requirements for weapons and research and development programs. Nuclear materials processing activities are carried out at Aiken, South Carolina; Richland, Washington; Idaho Falls, Idaho; Oak Ridge, Tennessee; Los Alamos, New Mexico; and Livermore and Santa Susana, California.

The increase for processing operating expense funds increases by $34,998,000 over FY 1986 levels. This increase is composed of escalation ($23,220,000), Special Isotope Separation activities ($1,100,000), and other programmatic activities ($10,678,000).

Idaho

At Idaho, an additional $3,982,000 for program growth is requested over the FY 1986 level of funding. The increase will continue current operations, provide the scheduled support for the Idaho restoration efforts, and provide for continuation of environmental and security activities.

The Idaho Fuel Processing Facility will continue to receive spent nuclear fuels from the naval propulsion program and fuels from research and test reactors in FY 1987 for recovery of the residual highly enriched uranium. The enriched uranium will be returned to Oak Ridge for future defense program needs. In FY 1987, fuel processing activities will provide recovery of uranium-235.

Spent fuels containing uranium-235 are scheduled to be received at the Idaho Fuel Processing Facility in FY 1987. These fuels will be unloaded from their shipping casks and placed either in underwater fuel storage racks at the Fluorinel fuel storage facility or in dry storage racks at the Graphite Fuels Storage Facility.

Spent fuel dissolution operations in FY 1987 will be conducted in two different head-end processing facilities. The principle dissolution operation will be conducted in the Fluorinel process cell where naval program fuels will be dissolved. Also planned in FY 1987 is operation of the multi-curie cell where smaller quantities of unique fuels and scrap materials will be custom processed.

Uranyl-nitrate solutions from the dissolver operations will be transferred to the solvent extraction facilities located in the CPP-601 building where the uranium will be extracted, purified, and converted to a solid product. An increase of approximately $3,082,000 above FY 1986 levels for processing activities is required to support the manpower, chemical and utility requirements for the increased FY 1987 production.

Success of the planned materials processing operations in FY 1987 requires the direct support of a number of organizations to assure that these operations are conducted in an efficient and safe manner. Direct production support from a variety of disciplines including health physics, quality assurance, engineering, safety analysis, analytical chemistry, maintenance, and safeguards and security provides assurance that fuel processing operations are conducted within acceptable standards. In FY 1987, funds are provided to augment environmental review activities and to increase programs for the reduction of radiation exposure.

Technical support and process development efforts will continue in support of the Fuels Processing Restoration project (85-D-139). This project provides for the replacement of the originally constructed solvent extraction facilities in building CPP-601 and will provide the throughput and reliability required to meet future process requirements. To support this project adequately in FY 1987, an increase of approximately $900,000 is required for efforts in engineering support, long-lead procurement support, process support, and cost and schedule control.

Richland

At Richland, an increase of $9,375,000 over the FY 1986 level is requested for FY 1987. This amount includes increases for advanced planning and technology, facility maintenance, and for security enhancements. Security activities accounts for $4,425,000 of the increase.

The principal mission for Richland nuclear materials processing is providing weapon-grade plutonium metal to the Rocky Flats Plant and fuel-grade plutonium oxide to the Savannah River Plant for blending with high purity plutonium to yield weapon-grade plutonium.

Processing of N Reactor fuel in the PUREX fuel processing plant resumed in FY 1984 and will continue into the late 1990's. While the PUREX plant was in standby condition from 1972 to 1983, irradiated fuel was stored underwater in cooling basins. Stored fuel is being processed at a faster rate than irradiated fuel is discharged from the reactor. In FY 1985 the backlog of fuel containing weapon-grade plutonium was processed except for newly discharged irradiated fuel being stored to allow decay of short-lived fission products.

In FY 1987 the PUREX plant will process fuel containing weapon-grade plutonium which has been stored for 180 days to allow decay of short-lived fission products and fuel containing fuel-grade plutonium. To improve cost effectiveness and reduce transportation demands, facilities for the conversion of weapon-grade plutonium nitrate to metal were restarted in FY 1985 after being in standby for about 12 years. This direct production of plutonium metal at Richland will obviate shipments of plutonium oxide to the

Los Alamos National Laboratory (LANL) for conversion to metal. Fuel-grade plutonium will be provided to the Savannah River Plant for blending. In addition, plutonium metal will be provided directly to Rocky Flats. The uranium recovered during fuel processing operations will be converted to oxide and shipped to the Feed Materials Production Center at Fernald, Ohio, for recycle. Fuel processing activities will be maintained in FY 1987 at about the FY 1986 throughput levels.

Scrap materials containing plutonium arising mainly from the reactivated plutonium metal line and material received from the Rocky Flats Plant will be processed in a cost-effective manner for recovery of the plutonium. Scrap material already in storage as well as scrap material generated from current operations will be processed for plutonium recovery.

Savannah River Plant

In FY 1987, the Savannah River Plant request for processing of nuclear materials is $8,201,000 greater than in FY 1986. The increase is needed primarily for initial operation of the new Special Recovery Facility, and for second-year funding for restart of a facility to process americium-243.

At the Savannah River Plant the reactor fuel and reactor targets discharged from the production reactors are cooled for about 6 months prior to processing in the F and H processing areas. The major products of the processing operations are plutonium-239, tritium and plutonium-238. Irradiated fuel is processed to recover enriched uranium for reuse. In FY 1987, highly enriched uranium will be processed.

During FY 1987, processing operations will separate high purity plutonium produced in the production reactors in FY 1986 for blending with fuel-grade plutonium from the Richland PUREX plant to produce weapon-grade plutonium. The processing of weapon-grade plutonium will increase. Tritium will continue to be extracted from irradiated lithium targets, separated from other gases and purified. Production and processing of plutonium and tritium will be carefully managed to meet requirements delineated in the Nuclear Weapons Stockpile Memorandum. Continued efforts will be made to maximize processing of nonspecification plutonium material to recover and purify the plutonium to produce weapon-grade plutonium metal product.

Funds are required to support the increased workload for processing the fuels and targets from the production reactors and to produce the nuclear materials required to meet the Nuclear Weapons Stockpile Memorandum. The processing plant workloads are greater in FY 1987 than in FY 1986 because this is the first year since 1968 when the fuel and targets from a full year's operation of as many as four production reactors have been available for processing. These workloads, in turn, require increased plant maintenance, quality assurance, and employee training in order to maintain safe, reliable production. Environmental activities will include monitoring, evaluation, and cleanup of groundwater contamination. Engineering studies will be performed on the deactivation and decommissioning of separation area seepage basins. To assure future environmentally acceptable facility operation, the request includes continuation of an FY 1986 project (86-D-154) for construction of an effluent treatment facility to treat radioactive and hazardous discharges.

The Central Scrap Management Office will continue management of the recovery of plutonium-238 and plutonium-239 from scrap from various production sites. Plans are for the Special Plutonium Recovery Facility project (82-D-201) to be operational by mid-FY 1987 for processing scrap and residues to recover the plutonium in a cost effective manner. In FY 1987, approximately $3,675,000 is included for first year Special Recovery Facility operations. Recovery of plutonium from scrap and residues is very cost-effective in comparison to the cost of producing new plutonium.

Other Sites and Activities

A funding decrease of $11,365,000 is provided for FY 1987 for activities at the Los Alamos National Laboratory compared to FY 1986. The funding decrease reflects the cost-effective completion in FY 1986 of the campaign for converting weapon-grade plutonium oxide from the Richland PUREX plant to plutonium metal for shipment to the Rocky Flats Plant. In FY 1987 the residues from the campaign will be processed for recovery of the plutonium. Activities will continue for the processing of nonspecification plutonium and scrap at Los Alamos to meet program requirements. The funding request will provide for continued independent review and analysis of the safety of new and modified facilities.

In FY 1987, the Materials Management Executive Committee will continue planning and coordinating all intersite activities concerning the use of materials for defense programs. Included in these activities are material shipping, intersite planning and modeling, and exchange of technology between sites.

The FY 1987 request for funds for continuing fuel decladding activities at Santa Susana, California, will decrease by $1,080,000. Decladding provides for a cost-effective means of recovering nuclear materials.

An increase of $1,565,000 is necessary to continue recovery of uranium-235 from scrap and for processing Californium-252 at Oak Ridge.

Special Isotope Separation

In FY 1986, $70,300,000 was provided for Special Isotope Separation research and development. The FY 1987 operating expense request is $74,900,000.

The request provides funding at about the FY 1986 level for research and development on the Special Isotope Separation process and also provides an option for the deployment of this technology at a future date. During FY 1986, the process readiness review requested by the Congress will be completed. The review will provide an updated evaluation of both the Atomic Vapor Laser Isotope Separation process and the Molecular Laser Isotope Separation process being developed by Los Alamos National Laboratory; establish the readiness of these technologies for deployment; and determine which best satisfies Special Isotope Separation production facility requirements.

	FY 1986 Adjusted Appropriation	FY 1987 Request
C. Supporting Services	$249,946	$252,500

Supporting services are essential to maintain production sites' operations at their increased levels and to continue the initiatives to increase production of nuclear material for national defense. Research and development on current operating processes is needed to assure continued, efficient, and safe operation and to meet production goals. This effort includes process optimization to maximize production at minimum unit cost, development of alternative production methods to respond to changes in production and product requirements, development of engineering improvements for fuel handling, environmental protection and safety concerns, etc. With the increase in materials requirements experienced over the last few years, it is essential to maintain an adequate level of research and development.

FY 1987 funds provide startup, shutdown, and standby costs for production facilities needed to meet either current material requirements or possible future requirements. Other supporting services activities include production of lithium compounds and uranium metals for weapons; transportation and security for material shipments; conceptual engineering studies; safety, environmental and safeguards costs; long-range nuclear materials management planning; general site safety improvement activities; warehousing; funding of inventories such as common use stores, process spares, and production of other nuclear materials inventories; and miscellaneous contractor activities such as award fees, employee group insurance, and employee pension funds. Procurement of process spares is essential to assure continued plant operations in the event of equipment failure, especially for fuel fabrication, fuel processing, and reactor refueling.

Of the change, $12,505,000 is for escalation. This results in a net program decrease of $9,951,000. The net decrease is due to the termination of the plasma separation process technology development program at TRW, a contractor directed by the San Francisco Operations Office.

Albuquerque

Research and development will continue to further optimize the plutonium Molecular Laser Isotope Separation process at the Los Alamos National Laboratory. Subscale process experiments will be conducted in existing facilities to investigate advanced photophysics and chemical techniques. Efforts will also include research and development work to investigate advanced laser systems that show potential for process efficiency and cost benefits. There is a decrease in funding of $3,359,000 primarily for the Molecular Laser Isotope Separation program to reflect completion of laboratory scale test system construction.

Idaho

At Idaho, supporting services will be reduced by $942,000 from the FY 1986 level. Services provided in FY 1987 include conceptual engineering studies for general plant needs, engineering for capital equipment procurements, minor facility startup projects, and procurement of plant operating spare equipment. The decreased funding reflects the reduction in facility startup costs.

Oak Ridge

Of the increase in supporting services, an additional $4,007,000 is requested for the Oak Ridge operations.

The Oak Ridge Y-12 Plant will produce enriched lithium compounds, and the Fernald, Ohio, Feed Materials Production Center will produce depleted uranium metal for use in nuclear weapons in FY 1987.

At the Fernald, Ohio, Feed Materials Production Center, the FY 1987 request provides for operation of the facility to convert depleted and slightly enriched uranium from a hexafluoride (UF_6) to a tetrafluoride (UF_4) form.

At the Oak Ridge National Laboratory, decontamination activities will be performed in FY 1987 following the complete conversion of the uranium-233/uranium-235 solution to solid form. Feasibility studies and engineering studies are currently underway on the possible deactivation of uranium-233 processing facilities as a cost savings measure.

An additional $2,000,000 is included in the FY 1987 budget for rewinding of the motors at the Portsmouth Gaseous Diffusion Plant to increase production capacity by almost 60 percent. Also, $4,000,000 is being provided to assist in maintaining the Oak Ridge Gaseous Diffusion Plant in standby. These tasks are required for future uranium requirements which cannot be met under current conditions.

Richland

At Richland, requested funds will support continuation of the decontamination and decommissioning of the highly contaminated KE-Fuel Storage Basin, to minimize future surveillance and maintenance costs, and human exposure to radiation. Level of effort funding is provided to maintain and administer safeguards and security activities and upgrade projects, and to provide conceptual engineering support for general plant projects and construction projects. Also, inventories of spare parts for old and often obsolete reactor components will be maintained.

FY 1987 technical development funds at Richland include those costs associated with development of new and improved processes for fuel fabrication and irradiation activities. Funding provides for continuing investigation into end cap associated fuel failures and charge/discharge operations. These efforts should result in increased reactor operating time and production and reduced personnel radiation exposure.

Project support activities will be increased in FY 1987 by $4,410,000 for the Process Facility Modifications (PFM) Project (84-D-135). The project will provide cost-effective means for recovering plutonium from Fast Flux Test Facility (FFTF) fuel and for reducing N Reactor fuel processing costs by the mid-1990's. Plutonium recovered from FFTF fuels will be used for blending with high purity plutonium or processed further to meet requirements. Both uses will increase the availability of weapon-grade plutonium. The mechanical decladding of N-Reactor fuel in PFM will significantly reduce the volume of high-level wastes and thereby reduce waste management costs. The FY 1987 request for PFM project support increases by $4,410,000 to allow the completion of ongoing prototype equipment mock-up activities and to continue process verification and facility operability studies as well as technical reviews of design and construction activities.

Savannah River Plant

At the Savannah River Plant, funding will increase for supporting services by $13,258,000. Of the increase, approximately $4,460,000 is for security activities. The remainder is for process development, landlord functions, inventory replenishment, etc.

The FY 1987 funding for the Savannah River Plant provides operating expenses for common use stores and process spares inventories to support reactor operations. This includes support for recent additions in reactor equipment as a result of the restoration and upgrade programs to improve productivity. The Savannah River Laboratory will continue to perform technical development activities in support of site operations. Among these activities are development of robotics for improved efficiencies and safety and development of equipment and systems to extend the life of the Savannah River Plant reactors.

Chemical processing development is required at the Savannah River Plant to increase operability and maintainability of existing facilities and new facilities. In FY 1987, these activities include support to the canyon renovation projects, improved process controllers, and on-line analytical instrumentation. In addition, the development of improved environmental monitoring techniques, advanced computer modeling of environmental dispersion behavior of radionuclides, and safety analyses will be supported.

	FY 1986 Adjusted Appropriation	FY 1987 Request
D. Program Direction	$22,276	$22,900

The FY 1987 request for program direction provides for salaries, benefits, travel, and other associated support costs for 348 full-time equivalents--48 for DOE Headquarters and 300 for Savannah River Operations Office. The FY 1987 level is an increase of $624,000 from the FY 1986 amount which includes a planned reprogramming in FY 1986. The FY 1987 staffing level is an increase of 11 positions at Savannah River to support environmental, safety, security, productivity retention, and Defense Waste Processing Facility activities.

Savannah River Plant

The primary mission of the Savannah River Operations Office is the technical and contractual direction, management, and oversight of the below listed programs; with national defense programs comprising over 95 percent of the mission. The principal goal of the defense activities is to provide the necessary nuclear materials and weapons components for the Nation's defense programs, fuel material for the Naval Nuclear Propulsion Program, and for safe storage of nuclear waste byproducts.

- Nuclear Materials Production
- Weapons Activities
- Defense Waste and Transportation Management (Interim, High Level Waste Technology Development and Defense Waste Processing Facility)
- Naval Fuel Materials Facility
- Biological and Environmental Research
- Energy Conservation (Atlanta Support Office)
- Space Nuclear and Basic Energy Science

Employment at the Savannah River Plant for the above programs is currently about 15,300. The Savannah River Plant operates four nuclear production reactors. The reactors are supported by facilities for fuel and target fabrication, chemical processing and storage of radioactive waste. The Defense Waste Processing Facility, now under construction (scheduled for 1989 completion), will lead to solidification of high-level radioactive waste for permanent storage in a designated Federal repository. The Savannah River Operations Office provides the major support for conduct of Nuclear Materials Production activities; it receives greater than 40 percent of the annual Nuclear Materials Production program funding. The Nuclear Materials Production program is the largest program at the Savannah River site.

Salaries, benefits, travel, and other associated activities support the Savannah River Operations Office management and oversight of the above programs and are funded from Program Direction. Program Direction also provides support services for IG staff (5), General Accounting Office, Calculon and other support service contractors.

Headquarters

The Headquarters FY 1987 program direction request provides for salaries, benefits, travel, and supporting services for 48 full-time equivalents at the facility in Germantown, Maryland.

The Headquarters staff is responsible for direction, management, and overall support of the Nuclear Materials Production program. This includes such activities as the development of program goals, objectives, and plans consistent with Administration policy; formulation and justification of the proposed budgets and program initiatives to the Office of Management and Budget and the Congress; performance of management and technical reviews, safety evaluations and other studies, analyses, and evaluations to assure program accomplishments, to continually optimize technical, managerial and economic aspects of the programs, and to assure effective, efficient, safe, secure, and environmentally-acceptable program operation; and coordination of the program with other agency programs, other Federal agencies, the Office of Management and Budget, the Congress, the United Kingdom and other allies, field offices, and numerous contractors.

	FY 1986 Adjusted Appropriation	FY 1987 Request
C. Enriched Material	$169,600	$204,500

The FY 1987 request provides funding for separative work and other associated costs to provide enriched material for the Nuclear Materials Production and Naval Reactors programs.

A total of $190,000,000 is needed to supply uranium-235 to Naval Reactors in FY 1987. This request is $29,600,000 above the FY 1986 level. The highly enriched uranium will be used for fabrication of reactor cores used in shipboard and prototype naval reactor plants.

The request also includes $14,500,000 to provide slightly enriched uranium for the Richland N Reactor. This increase of $5,300,000 provides additional slightly enriched uranium to replace N Reactor recycle material that does not meet DOE specifications.

	FY 1986 Adjusted Appropriation	FY 1987 Request
II. Capital Equipment	$109,540	$126,090

Reactor and processing operations utilize large, unique, and expensive items of equipment. A significant portion of this equipment is approximately 30 years old. In the corrosive environment of fuel processing facilities, stainless steel or equivalent material resistant to corrosion must be used. Also, because of the high radiation levels in the processing facilities, equipment must be specially designed for remote in-place maintenance and removal. Nevertheless, the capital equipment request is less than 1 percent of the total investment in the nuclear material production facilities.

Equipment is repaired and maintained to assure a high level of operation. When replacement parts are no longer available for installed equipment, modern replacement equipment is procured, installed, and integrated into the remainder of the process systems, if possible. However, in many instances, old equipment must be repaired and irreplaceable parts must be fabricated on site, an expensive and inefficient alternative.

The FY 1987 request is $16,550,000 above the FY 1986 level. Of the increase, $5,605,000 is for escalation, and $10,945,000 is for programmatic activities.

A. Reactor Operations

Capital equipment funds will be used to support full operation of the production reactors at the Savannah River Plant and N Reactor at Richland. Oak Ridge funding supports the reactor feed plants at Fernald and Ashtabula, Ohio, and the Y-12 Plant at Oak Ridge, Tennessee.

Richland

The capital equipment funds for N Reactor will support reactor operations, fuel manufacturing and other activities including production support equipment ($1,000,000) for plutonium production; equipment for the Production Assurance process tube replacement activity ($4,600,000); an automated refueling system computer to control safety interlocks, operations sequence, and process tube alignment ($700,000); a fuel basin debris handling system ($825,000) to reduce radiation exposures; nondestructive examination equipment upgrades ($670,000); and Class VI computer support ($600,000) for increased activity of weapon-grade plutonium production consistent with long-range program objectives.

Savannah River Plant

Major new items of capital equipment needed for the Savannah River Plant reactor operations include two spare process water heat exchangers ($3,100,000) to minimize releases of tritium into the reactor effluents; replacement inspection equipment ($1,000,000) to assure that nonspecification slugs are rejected before reaching the reactors; a process monitor ($1,000,000) to monitor and control the slug manufacturing process; replacement of the emergency lighting ($800,000) at each reactor to meet safety and security criteria; and replacement of the neutron sources at each reactor ($1,000,000) to effectively implement nuclear safety criteria.

Oak Ridge

At the FMPC, Fernald, Ohio, budgeted items are essential to maintain the efficient operation of the facility. One major item ($4,400,000) is a new Transfermatic Machine in Plant 6 to replace the 20 year old, obsolete machine that is now in use. This machine, originally in the FY 1986 budget, was deferred to FY 1987 because of the urgent need to purchase HEPA filters (to be funded originally in FY 1987) to stop excess environmental releases of uranium that threatened the continued operation of the FMPC. Another major item ($4,190,000) will replace three old ingot lathes with two new ones. Existing lathes are badly worn and are a threat to worker health because of a lack of proper ventilation systems to remove hazardous vapors created during the cutting process. At the Ashtabula extrusion facility, a major item ($1,000,000) is needed to upgrade the extrusion press to meet current safety standards established by the American National Standards Institute.

B. Materials Processing

Increased capital equipment procurements are necessary to support the continued high capacity operations of the nuclear materials processing facilities.

Idaho

Equipment procurements planned in FY 1987 will provide replacements for equipment no longer suitable for continued use and will upgrade capabilities to meet future process requirements. Examples of equipment procurements planned for FY 1987 include: specialized dissolution and handling equipment to upgrade custom processing capabilities, upgrades of equipment and software for the FAST operating process simulator, expansion of the remote mockup system for equipment verification in the Fuels Processing Restoration project, and renovation and equipment upgrade of the radiochemical laboratories. Routine process equipment, e.g., pumps, valves, samplers, and electrical equipment, also will be procured to support process operations.

Richland

An increased level of capital equipment is required to support the operability of the PUREX fuel processing plant and the plutonium metal conversion facility. Replacement equipment includes dissolvers, extraction columns ($350,000), pumps, agitators, centrifugal contractors ($950,000), vessels and heating and ventilation items. The request includes $1,000,000 for shielded casks to transport fuel from the Fast Flux Test Facility to the Process Facility Modifications project for processing.

Savannah River Plant

Capital equipment needs to be increased to support continued high capacity operability of processing facilities. Replacement equipment must be maintained in inventory for rapid installation when an equipment failure occurs that interrupts operations. Replacement equipment items include centrifugal mixers and contactors, tanks, evaporators and product concentrators.

Other Sites

The Los Alamos National Laboratory request for capital equipment includes items to support recovery of plutonium from nonspecification and scrap materials including pumps, agitators, and instrumentation.

Special Isotope Separation

Capital equipment will be procured to support laboratory experiments on the Atomic Vapor Laser Isotope Separation process at Lawrence Livermore National Laboratory. Of the total capital equipment funding, $1,000,000 is for SIS.

C. Supporting Services

Savannah River Plant

Major new items of capital equipment needed for the Savannah River Plant support operations include an upgrade of the emergency diesel generators ($3,000,000) to provide backup electrical service; additional air compressors to replace the 30-year old compressors at each reactor ($1,500,000); replacement of the domestic, fire and service water pump turbines ($900,000) to improve reliability and reduce maintenance; installation of high volume constant air monitors ($3,000,000) to meet current safety regulations; a separations support facility to support development and testing of new equipment; an upgrade of the data communications between computer systems; and five CAD/CAM work stations to be fully compatible with computer systems initiated in FY 1984 ($1,290,000).

Oak Ridge

At the Oak Ridge Y-12 plant, capital equipment funds are needed to continue the upgrading of lithium processing equipment. Much of this equipment is very old and badly worn, requiring replacement if the lithium production output is expected to meet established goals.

Idaho

Equipment procurements planned in FY 1987 include: replacement of the obsolete electrical panels throughout the plant; an automated computer controlled drawing file; retrieval, printing and control system to accommodate the large volume of plant drawings; heating and ventilating equipment, including blowers, to replace obsolete equipment originally installed in the 1950's; and numerous lesser cost items of equipment including instruments, electrical test equipment, bar code readers, and computer terminals and printers.

Richland

Supporting equipment procurements are planned to provide containers to transport contaminated failed equipment to waste management facilities, calorimeters for measuring special nuclear materials and instrumentation to monitor materials.

Site General

Finally, capital equipment is procured to support plant-wide activities at all of the production sites. Such equipment is also required to provide for health, safety, environment, and safeguards concerns. Maintenance costs have become excessive and replacement is necessary to continue operations.

	FY 1986 Adjusted Appropriation	FY 1987 Request
III. Construction	$210,857	$343,666

The FY 1987 request for construction will provide for:

- General Plant Projects at all sites;
- Initiation of a project to reduce chemical discharges to the process sewers from the N Reactor fuel fabrication facility at Richland;
- Partial design on a radioactive liquid effluent treatment facility for the Richland N Reactor;
- A new project to prevent spills of hazardous and/or radioactive materials into ground or surface waters around the Savannah River Plant;
- Initiation of a project to reduce uranium discharges from the Fernald Feed Materials Production Center and ensure that plant operations do not pose a threat to the environment, the community, or the work force;
- Continuation of a Productivity Retention project essential to maintaining production capabilities at the Fernald Feed Materials Production Center and at the Savannah River and Richland production sites;
- Continuation of the installation of an in-core neutron monitoring system at Richland;
- Continuation of the upgrade of the electrical systems in the PUREX fuel processing plant at Hanford to replace deteriorated insulation on the wires, replace worn switch gear and separate emergency wires from the routine cable trays to improve operability and safety of the plant;
- Continuation of a project at the Savannah River Plant to upgrade the electrical distribution system for the production reactors;
- Continuation of the installation of an additional tritium furnace and containment system at the Savannah River Plant to ensure production capability and reduce tritium releases;
- Initiation of a project for thermal mitigation of the Savannah River Plant C and K Reactor cooling water discharges to meet National Pollution Discharge Elimination System permit requirements;
- Continuation of a new waste water storage and treatment facility for the F and H Separations Areas at the Savannah River Plant. Under the Resource Conservation and Recovery Act, this facility must be operational by November 1988;
- Continuation of construction projects at the Savannah River Plant, Idaho, and Richland to improve the security of key nuclear materials production facilities and materials;
- Continuation of a project to provide facilities to directly hydrofluorinate plutonium oxide to plutonium tetrafluoride for conversion to metal;
- Continuation of a project for restoration of the Idaho Fuel Processing Facility to assure support for the U.S. Navy nuclear program and recover valuable uranium for the Department's defense programs;
- Continuation of a project at the Fernald, Ohio, Feed Materials Production Center needed to assure continued safe and reliable operation and meet DOE commitments to improve conditions at the Fernald site;

- Continuation of Fuel Production Facility construction at the Savannah River Plant to eliminate the need for over-the-road shipments of uranyl nitrate solution to Oak Ridge and to allow for conversion to more efficient powder metallurgy fabrication techniques;
- Continuation of design and minimum construction activities necessary for the expansion and modification to existing fuel processing facilities at Richland;
- Continuation, on a stretched-out schedule, of modifications to the existing DOE-owned fuel processing facilities at Richland for improved head-end fuel dissolution to provide the capability for processing and recovering plutonium from DOE-owned fuels not currently amenable to processing in the United States and for improved processing of N Reactor fuels;
- Continuation of a project at the Oak Ridge Y-12 plant to renovate an existing highly enriched uranium conversion facility;
- Continued facility restoration efforts at the Savannah River Plant to return critical production facilities to a condition adequate to meet mission requirements;

Detailed information on individual construction projects is included in the Construction Project Data Sheets.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET SUBMISSION
CONSTRUCTION PROJECTS OVERVIEW
MATERIALS PRODUCTION

Project Number	Project Title	TEC [a]	FY 1986 Adjusted Approp.	FY 1987 Request
87-D-146	General Plant Projects, VL	$ 35,980	$ 31,945	$ 35,980
87-D-149	Reduced Chemical Discharges to Process Sewers, RL	3,150	0	3,150
87-D-150	Radioactive Liquid Effluent Treatment Facility, Partial Design Only, RL	4,000	0	4,000
87-D-152	Environmental Protection Plantwide, SR	6,500	0	1,500
87-D-156	Reactor Effluent Cooling Water Thermal Mitigation, SR	109,000	0	5,000
87-D-159	Environmental, Health, and Safety Improvements Phase I, FMPC, OR	60,000	0	10,000
86-D-148	Special Isotope Separation Project, VL	3,805	3,805	0
86-D-149	Productivity Retention Program, Phase I and II, VL	282,100	19,600	76,225
86-D-150	In-core Neutron Monitoring System, N Reactor, RL	7,550	5,130	2,090
86-D-151	PUREX Electrical System Upgrade, RL	8,300	2,380	3,900
86-D-152	Reactor Electrical Distribution System, SR	21,000	2,710	7,700
86-D-153	Additional Line III Tritium Furnace, SR	16,000	1,805	7,300
86-D-154	Effluent Treatment Facility, SR	50,000	2,500	15,650
86-D-156	Plantwide Safeguard Systems, SR	50,000	2,710	13,900
86-D-157	Hydrofluorination System, FB-Line, SR	9,200	2,000	2,510
85-D-137	Vault Safety SNM Inventory System, RL	4,400	1,900	0
85-D-139	Fuel Processing Restoration, IFPF, ID	270,000	13,530	35,000
85-D-140	Productivity and Radiological Improvements, FMPC, OR	47,000	15,000	23,500
85-D-145	Fuel Production Facility, SR	85,000	18,000	35,500
84-D-134	Safeguards and Security Improvements, Plantwide, SR	52,500	6,315	14,650
84-D-135	Process Facility Modifications, RL	240,000	14,475	35,000
84-D-136	Enriched Uranium Conversion Facility Modifications, Y-12 Plant, OR	20,600	12,200	3,000
84-D-137	Facility Security Systems, Upgrade, IFPF, ID	10,000	4,700	300
83-D-148	Non-Radioactive Hazardous Waste Management, SR	22,100	7,760	0
82-D-124	Restoration of Production Capabilities, Phase II, III, IV, & V, VL	367,250	39,600	7,811
82-D-126	Reactor Safety and Reliability, VL	40,600	1,800	0
82-D-201	Special Plutonium Recovery Facilities, JB-Line, SR	83,800	4,400	0
82-D-136	Fuel Processing Facilities Upgrade, IFPF, ID [b]	46,000	0	0
-	Reductions from Prior Year Unobligated Construction Projects	-	-3,408	0
			$210,857	$343,666

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[a] Excludes PE&D funds

[b] Project scope change only.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: General plant projects, various locations — 2. Project No. 87-D-146

3. Date A-E work initiated: 1st Qtr. FY 1987 — 5. Previous cost estimate: None

3a. Date physical construction starts: 1st Qtr. FY 1987

4. Date construction ends: 4th Qtr. FY 1990 — 6. Current cost estimate: $35,980
Date: 1/86

7. Financial Schedule (Prior year projects shown for comparative purposes)

Fiscal Year	Obligations	Costs	
		FY 1987	After FY 1987
Prior Year Projects	$ xxx	$18,090	$43,708
FY 1987 Projects	35,980	7,190	28,790

8. Brief Physical Description of Project

This project provides for various items of new construction, additions, alterations, and retirements to the land, buildings and utility systems at Savannah River, Richland, Idaho, Oak Ridge, and Albuquerque to support program needs in the areas of health, safety, environment*, safeguards, general support, materials production program needs, and other program requirements of the department.

Savannah River	$ 16,180
Richland	8,700
Oak Ridge	6,000
Idaho	4,200
Albuquerque	900
Total Materials Production Program	$ 35,980

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*Some improvements may be located on non-government owned land

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations   2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project

Although it is difficult to provide a detailed description of this type of project in advance, listed below are examples of subprojects under consideration. In general, the estimated cost given for each of the listed subprojects is preliminary in nature and primarily indicative of the size of the project. It should be noted also that the continuing study of requirements will result in some of the projects being changed in scope or postponed, or other projects being added, all depending on conditions or situations not apparent at this time. The total estimated cost of a project may not exceed $1,200,000 including the cost of installed equipment when it is an integral part of the project.

Savannah River $16,180

Minor Projects, each $75,000 or less .... $ 3,040

A continuing need exists for capital improvements, each costing $75,000 or less, to general plant facilities to assure continued safe operation of plant structures and utilities. An estimate of $75,000 is included in this project for the Savannah River Ecology Laboratory (SREL) to fund minor modifications and improvement of existing facilities.

Instrument Air Improvements, 190, 183-4 & 184 PKC Reactor Areas................ $ 900

Provide the following items:

1. State of art instrument air dryers capable of supplying instrument air at -40@F.
2. Continuous on line dew point monitoring with alarm panel indicators.
3. Replace fouled instrument air supply piping and impulse lines at 184-K
4. Convert air compressor cooling water supply to domestic water.
5. Replace 7" x 7" compressor heads with 8" x 7" compressor heads.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

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9. Purpose, justification of need for, and scope of project (Cont'd.)

Justification:

1. New powerhouse and water plant instruments require high quality, reliable instrument air. Existing instrument air dryers are steam heated. Parts unavailability often results in prohibitively high downtime.
2. Continuous dew point monitoring will provide better surveillance of instrument air quality.
3. The operating contractor has advised that the instrument air lines at 184-K are questionable quality due to possible oil, water, and grit fouling.
4. Heat exchanger fouling problems would be greatly reduced.
5. Increased capacity and easily available repair parts would result.

Failure to perform this work could result in unscheduled down time due to instrument air failure. The inability to provide quality instrument air could result in inaccurate instrument readings due to fouled instruments.

D-Wing Clean Laboratory Renovation, 735-A .... $ 300

Reclaim a portion of D-Wing, 735-A basement and install a 900 sq. ft. modular laboratory enclosure, with completely controlled environment, a fire suppression system, and several hoods. The modular enclosure will be a Class 10,000 "clean room" to provide radioactivity contamination-free, instrumental operating space. Services such as chilled water, steam, process hot and cold water, 90# air gases and drain will be made available. The present Ultralow Level Instrumental Analysis Facilities are used to capacity and cannot accommodate the sample analysis workload and necessary analytical equipment that are required to support studies requested in support of Special Programs and environmental monitoring. These programs require the ultimate in low radiation background and an absolutely radionuclide, contamination-free environment. The renovated facilities will house a $500,000 yearly programmatic effort to conduct interpretive studies on data obtained from highly sensitive measurements on 4000 samples per year.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

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9. Purpose, justification of need for, and scope of project (Cont'd.)

Mass Spectrometry Facility Expansion, 735-A	$ 350

Add a 1500 square feet expansion to the east (plant) of the existing Mass Spectrometry Facility. The expansion will consist of a 1000 square feet spectrometer module meeting Class 1000 clean room specifications; a 250 square feet filament preparation lab module meeting Class 100 clean room specifications; a 150 square feet filament loading lab module meeting Class 100 clean room specifications and directly connected to the filament preparation module; and a 100 square feet storage room for supplies and spare equipment. The existing 900 square feet Mass Spectrometry Facility is not large enough to accommodate the planned acquisition of a general purpose low-level mass spectrometer (FY 86). That acquisition is necessitated by an increasing sample load which is currently preventing efficient use of an existing, highly specialized three-stage mass spectrometer, the existing facility also contains a static gas mass spectrometer and analytical laser instrumentation.

Entry Control, 703-46A	$ 995

This building will house visitor control, lobby, plantwide access computer center, SRP and DOE Security Personnel, Public Affairs, DOE Public Reading Room and guard entry to 700 Administrative Area. Four trailers could be released upon completion of this building.

Additional Fence and Street Lighting, 300-M	$ 300

Additional security lighting will be provided within the 300-M protected area and 321-M exclusion areas as necessary to eliminate potential areas of adversary concealment around operating facilities. Adequate lighting is necessary for security inspector assessment of these areas and meet the requirements of DOE Order 5632.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Additional Honeycomb Storage, 321-M .... $ 500

Additional borated concrete honeycomb storage will be installed in Building 321-M, to increase the existing number of positions, 1780, by 1000.

The existing storage is insufficient to permit efficient interim storage of fuel and target tubes at present production rates, which are approximately twice those of two years ago. It is at times necessary to halt extrusion operations due to lack of storage. The additional storage will reduce radiation exposure and enhance operating efficiency.

SWE Shop and Changeroom, 211-F .... $ 995

Provide change rooms and non-regulated shop space in the 211-F area. The F-Area outside facilities need change rooms for personnel to enter the regulated portions of 211-F. The existing male change rooms are obsolete and located remotely from the area requiring employees to travel through clean areas in regulated clothing. No permanent female change room is located in the area. Shop space is needed to support major installations of electronic equipment currently authorized.

Replace Deepwell, 905-71G .... $ 500

Provide a new deepwell and pump of similar capacity as that of 905-71G.

The relocation of construction personnel from TC-1 to Central Shops will increase demands on the central shops domestic water system. Failure to replace this well could result in limited water supplies and inadequate fire protection water.

1. Title and location of project: General plant projects, various locations   2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Replace Deepwell, 905-13G .... $ 500

Replace existing deepwell with one of similar size and capacity. This is a domestic well servicing TNX.

The average life of a deepwell on plant is approximately 28 years. Beyond this, the well casing begins to deteriorate causing a reduction in well capacity flow rate. This well has exceeded its useful service life and is operating at reduced capacity, demonstrating its need for replacement.

Waste Compactor and Building, 321-M .... $ 400

A building will be constructed adjacent to Building 321-M and a compactor will be installed to reduce the volume of contaminated waste. Project will enable more efficient use of Burial Ground space.

Records Management, 773-51A .... $ 995

Consolidates Records Management functions presently located in basements of 703-A and 773-A. Consolidates permanent records storage presently in non-DOE standard locations across the plantsite. House plant central mail room and provide visitor/conference center for SRL. Five trailers could be released upon completion of this building.

Replace Low Voltage Power Cables, 483-D .... $ 900

Replace underground low voltage AC and DC power cables, control cables, and conduit in the Water Treatment Plant, 483-D.

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

These cables have been in service for 31 years. Some of the original cables have failed and were replaced by the operating contractor Department in recent years in order to maintain plant operation. Future demands on the 400 Area power facilities (i.e. D-F and D-TNX Steam Lines) has increased the reliability requirements of the Powerhouse. Replacement of these cables is necessary to meet these requirements.

Canyon Office Building, 200-F .... $ 500

Provides office space for 200-F Canyon personnel. Increased computer process operation will occupy present office facilities.

Equipment Storage Facility, 711-G .... $ 750

Design and construct a permanent building to provide storage space for portable equipment. The present storage facility, building 710-G, provides approximately 60% of the equipment storage space currently required. Due to the lack of sufficient storage space, equipment must be stored unprotected from the environment. This causes unnecessary premature deterioration of equipment. In addition, 710-G was constructed 30 years ago as a temporary structure and is in need of replacement.

Upgrade Lower 700-A and SRL Area Lighting .... $ 820

Provide additional fence and street lighting in the lower 700 area and SRL to meet DOE security specifications and Du Pont Standards for safe general area and roadway illumination.

Provide Permanent Coal Handler's Building and Office Complex, 484-D .... $ 350

Provide a permanent building to replace the temporary coal handling trailer in 400-Area. The new facilities must include an office, lunch room, bath rooms, showers and lockers for men and women. The new facilities must be large enough to satisfy the needs of 14 employees.

The existing trailer has deteriorated and is in extremely poor condition. It is not large enough to satisfy employee needs. No women's facilities are provided.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

13.8 Static Wire (C-Area to Central Shops) .... $ 300

Install a static wire for the existing 13.8 kV line from 100-C to Central Shops.

The line is vulnerable to power outages caused by lightning. Lightning causes O.C.B. 15-C to relay out due to action of the overcurrent relay.

SREL Library .... $ 800

The SREL technical staff has expanded by almost 50 since moving into the building in 1977. Because of the increase in staff and additional projects, more technical documents are needed in the library. SREL has utilized all available space and are not able to expand to handle the vast numbers of documents needed for laboratory operation.

Others

Welding Facilities, 105-KC	$ 200
Extend Parking Lot, 100-P	$ 100
Improvements (FY 87) to WSI Facilities, TC-1	$ 150
Meteorological Engineering Lab Expansion, 735-7A	$ 200
Human Factors Engineering Laboratory, 773-A	$ 100
Meteorological Weather Center Renovation, 773-A	$ 200
Service Floor Restrooms, 773-A	$ 150
Expand Restroom Facilities, 679-T	$ 100
Upstairs Restroom, 320-M	$ 100
Storage Building, 300-M	$ 150
Install Aluminum Stock Storage Pad, 315-M	$ 150
Coal Pile Drainage Improvements, 484-D	$ 110

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Boat Dock on L-Lake (SREL)........................$ 100

Heating & Air Conditioning System, 760-G........................$ 175

Richland........................ $8,700

Capital Work Orders .... $ 990

These are miscellaneous jobs of capital nature which are necessary to maintain continuity of operation, protection of the environment, and to provide safeguards for the protection of life and property. Such work would include additions, improvements, and replacement of structures, building services, utilities, and associated equipment.

RMC Ventilation Improvement .... $ 700

This project will improve the control over potential radioactive contamination at the Remote Mechanical-C Metal Line in the Plutonium Finishing Plant by replacing existing Filter Boxes 14, 20, and 22 with bag-in/bag-out filter boxes.

Q Cell Glovebox .... $ 900

This project will install a new glovebox in the Q Cell Loadout Room at PUREX Plant. The glovebox will receive neptunium nitrate from PUREX processing and will be equipped both for conversion of the nitrate to neptunium oxide and for loading out the oxide for future shipments away from PUREX.

PRF Filter Box Improvement .... $ 850

This project will replace the filter box on the fifth floor of the 234-Z Building with a new filter box having bag-in/bag-out features and a demister. The new equipment will improve controls over radioactive materials and eliminate the humidity problems now associated with the first stage filter boxes at the Plutonium Reclamation Facility.

PFP Ventilation Air Supply Improvement .... $
300

This project will install new dampers in the ventilation air supply ducts at the Plutonium Finishing Plant.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations   2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

KE/KW Tie-Ins to Alarm Monitoring System	$ 380

This subproject allows site security forces to respond in the most timely fashion possible to alarms originating in the areas where spent fuel is stored before transport. The user requirements the contractor has imposed are satisfied by incorporation of these alarms and the most effective alarm monitoring is provided.

1314-N Loadout Facility Upgrade	$ 475

This subproject provides for double containment of chemical waste in interim storage, and for monitoring and leak detection systems for the interim storage facilities. Personnel working in the Loadout Facility will be protected against potentially hazardous exposure to the waste by physical safeguards. Possible environmental contamination will be reduced.

Transfer Area Upgrades	$ 950

Installation of a transfer area airlock will eliminate the potential for the spread of airborne contaminants from a radiation zone by placing physical barriers between the radiation zone and surrounding environment. Installation of a concrete pad in the fuel transfer area will aid in cleanup of any contaminants released to the ground during railcar decontamination, and construction of a wall will prevent the potential releases of airborne contaminants from the transfer area. Addition of a shelter will enhance worker efficiency and provide more usable work space.

RWS-2/RW Hanger Replacement to Seismic Conditions	$ 800

This project will assure emergency core cooling and limitation of fuel failure by the Graphite Shield Cooling System during a seismic accident in which no direct fuel cooling is available. The raw water supply system to the Graphite Shield Cooling System cannot now withstand seismic forces postulated for such an accident. Should such an accident occur, water may not be supplied to the system increasing the potential for core meltdown.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Fuel Production Storage Building.. $ 210

New canisters, lids, loading tongs, pallets a forklift, and other equipment used in the transfer of fuel to the reactor are now stored in the open air. Weatherization and soil affect their operation and make periodic repair/refurbishment necessary. This project will eliminate the adverse effects of open air storage by providing a building to house the equipment.

Basin Debris Handling System .... $ 950

Use of an approved system for removal and containment of debris in the fuel storage basin will expedite collection of debris, increase the space available for fuel rod storage, and eliminate interference in canister placement now caused by the presence of debris.

T-Plant Ventilation System Upgrade $900

This project will upgrade the heating, ventilating and air conditioning system at the 221-T Building, 200 West Area, to allow continued long-term (20 year) use of the equipment decontamination facilities to support 200 Area operating plants.

HPV 107 & 108 Valve Replacement $295

The existing HPV 107 and 108 pressure reducing valves now leak so much in the closed position that the large steam boiler cannot be kept in the hot standby mode of operation without use of other valves for added control. Such inefficient valve operation adversely affects diesel fuel consumption and boiler efficiency. New efficient valves and an updated control system will assure optimal fuel use and boiler operation.

Oak Ridge..$ 6,000

Miscellaneous Items - Plant-wide,Feed Materials Production Center (FMPC) . $790

Based on experience in prior years and anticipated future requirements, this estimated amount is required for minor construction jobs related to buildings, roads, and utilities. Included are improvements to air conditioning systems, test and replacement of electric power feeder cable, and replacement of underground water and power lines.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations   2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

UF_6 Cylinder Storage Area Pilot Plant, FMPC $175

The UF_6 cylinder storage area south of the pilot plant is to be enclosed. The building will measure approximately 50 ft. x 105 ft. x 32 ft. tall.

This project is needed to insure that an adequate supply of UF_6 cylinders are available for vaporization in the autoclave area. This facility would also allow cylinders to be weighed upon receipt without additional handling by the relocation of the UF_6 scale to the receiving area.

Pilot Plant Green Salt Storage, FMPC $100

The shelter area on the northeast corner of the Pilot Plant is to be enclosed to provide short-term storage of green salt product. The shelter area is approximately 2,700 square feet.

This project is needed to provide a closed indoor storage area for greensalt which will afford protection from the weather while the product is awaiting transfer to a larger storage area.

North Side Access Road & Parking Lot, FMPC $400

A construction road from the north access road to the north gate and a construction worker parking lot are to be constructed at the north side of the outer fence.

This project is needed to handle the large quantity of construction workers and construction traffic to be on site during the FMPC Productivity Retention projects. The existing main gate access facilities will not be able to handle both the production and construction activities during this period.

Refurbish Health & Safety Building, FMPC $500

It is planned to refurbish the Health & Safety Building to coincide with the current guidelines for lighting, ventilation, energy efficiency, and space utilization.

This project is needed to provide adequate facilities for the increased Health & Safety staffs required by the more stringent regulatory requirements. The (infirmary) Medical Department requires major upgrading to bring it into line with today's standards. Additional requirements for Industrial Hygiene monitoring techniques must be efficiently implemented.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Upgrade Lighting - Plant-wide, FMPC $500

Lighting of inadequate intensity is to be replaced with new fixtures meeting current standards and work station requirements. Inadequate lighting is a serious problem for both worker safety and job task quality. In addition, some fixtures have corroded and require replacement.

Controlled Storage Pad - Plant 8, FMPC $200

A controlled storage pad is to be constructed on the west end of Plant 8.

The existing pad is deteriorated and was not constructed according to current controlled storage guidelines.

Refurbish Ash System - Boiler Plant, FMPC $420

The ash removal system is to be upgraded from boilers 1, 3, and 4 to the ash silo, included are lines, fittings, wash, and primary and secondary systems.

The ash control system at the ash silo is also to be upgraded for loading of the ash for transportation and disposal.

This project is needed to restore the ash system to a high degree of reliability. The existing system is a source of frequent maintenance and must be replaced to mitigate any potential major failure.

Boiler Plant - Electrical Upgrade, FMPC..................................$330

The boiler plant electrical equipment is planned to be upgraded. This work consists of replacing the main electrical feeders, worn switchgear, area lighting, and enclosing the substation.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations   2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

This project is needed to replace worn or deteriorated equipment to provide a high degree of reliability. The lighting is inadequate, and the substation must be enclosed to meet current codes.

Upgrade Steam System - Plant-wide, FMPC $950

The steam distribution and condensate return system are to be upgraded. The distribution piping is in relatively good shape; however, the isolation valves, pressure reducing stations, condensate receivers, and pumps are to be replaced.

This project is needed to insure adequate control of steam pressure, reduce steam loss due to leaks, and reduce the high maintenance requirements currently encountered.

Upgrade Electrical Distribution - Utilities, FMPC $760

The electrical distribution system is to be upgraded. The work includes replacement of electric feeders at the main substation, repair of the structures at the main substation, and upgrade of the manholes for improved safety of maintenance personnel.

This project is needed to provide reliable electric power to the plant. In addition, the safety of personnel is of prime importance.

Visitors Issue Center/Training Center, FMPC................................ $375

Provide a building between the northeast corner of First Street and the Service Building to provide control of visitor egress and ingress in terms of clothing cleanups. The building will contain clothing, safety glasses, goggles, lockers, sinks, and toilet facilities. Turnstiles will be sued to ensure a correct separation of clean side and process side of the building.

Health and Safety Training Facility, FMPC $250

Provide a training facility for use primarily by the Health and Safety Division. Purpose of this facility is to prepare and give training programs on all health protection subjects. The building will include a large room for about fifty people and will contain standard audiovisual aids, such as projectors, videotape players, TV monitors, and blackboards.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Lighting Modification, FMPC $150

Provide lighting of adequate intensity and replace with new fixtures meeting current work standards and work station requirements. Adequate lighting will improve worker safety and job task quality.

Miscellaneous Items, Reactive Metals, Inc. $100

Based on experience in prior years and anticipated future requirements, this estimated amount for minor construction jobs is related to roads, utilities, and buildings.

Idaho.. $4,200

Dry Storage for Miscellaneous Fuels $850

It is current DOE-ID policy that operating fuel storage areas not be used to store nonprocessable fuel for longer than five years. After that period, the fuel shall be stored in retrievable dry storage until final disposition is identified. At present there are a number of special spent fuels stored in water at the Fuel Receiving and Storage building that have been in storage underwater for longer than five years. These fuels have not been processed to date because either (1) no process has been developed to recover the uranium they contain or (2) the uranium content is so small that is is not economically feasible to process them in existing facilities. To comply with DOE policy, these special fuels will be moved to a dry storage configuration. There are approximately 125 kgs of U-235 contained in about 100 cans and 1,100 elements. Current plans are to stop use of pool storage in the Fuel Receiving and Storage Building by no later than the end of FY 1990. To ensure that this date can be met requires an FY-1987 project for underground vaults to store these nonprocessable fuels. Continued storage of these fuels underwater would increase the potential for release of fission products and resulting contamination. A lifting fixture will be provided for retrieving the storage canisters and geometry controls will be used to ensure criticality safety. Vault shielding will be provided to minimize radiation exposure.

Power Burst Facility (PBF) Dry Fuel Storage $650

ICPP has been designated as the storage site for the Power Burst Facility (PBF) irradiated fuel rods. Sixty cans of fuel will have to be stored. These rods are classified as nonprocessable at ICPP; therefore, dry retrievable storage must be provided. The storage facilities must provide for

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

security and surveillance requirements. This project will construct dry underground fuel storage vaults. A lifting fixture will be provided for retrieving the storage canisters and geometry controls will be used to ensure criticality safety. Vault shielding will be provided to minimize radiation exposure.

Radiochemistry Counting Facility $300

The Radiochemistry Counting Laboratory, located adjacent to spectrochemistry and analytical laboratories, analyzes samples collected from ICPP Process Streams. The reliability of the data collected by the radiochemical instrumentation is being adversely affected by existing low level background and transient radiation fields. In addition, the allowable floor loading in the laboratory prevents the optimum arrangement of the lead shielded counting caves resulting in less precise counting data, particularly on the low level samples. This project will provide for a new facility outside the normal laboratory space that will alleviate the problems with background and transient radiation fields. The results will be improved reliability of radiochemical counting data and increased sample throughput.

Vessel Off Gas (VOG) System for Pilot Plants $500

The plant VOG system does not supply adequate vacuum to maintain the pilot plants located in the CPP Process Technology Building, and the CPP High Bay Laboratory Building at negative pressure. As a result, NOx and other noxious gas as well as radioactive gases can potentially enter the pilot plant operating areas resulting in the need to shut down the applicable pilot plant areas on an emergency basis. All pilot plants in an area would be affected by such incidents resulting in lost time. Such delays could hinder ICPP from meeting process development and process verification milestones that support plant processing goals. This project will consist of installation of a mechanical blower system to boost the vacuum in the plant VOG system thereby alleviating this problem.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations   2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Ash Street Utilities Extension $400

Utilities (water, air, steam, service waste) are not presently available for the future projects on the east side of ICPP. This project will provide for the extension of these utilities inside a utility tunnel to provide for the future needs of ICPP, such as the Fuel Processing Restoration (FPR) Project, Guard House, Immobilization Facility, etc.

ICPP Roads and Paving $500

Due to ongoing projects and normal wear, the need arises to improve existing roads and to construct new road sections connecting facilities to existing roads. This project will include widening and paving of the north patrol road, paving the new access road between NWCF and the new office building, and paving the new parking area for the procurement warehouse complex; it will also provide chipping and sealing of the existing bus parking lot.

Transfer Line from F-Cell to NWCF $600

Radioactive solids are removed from Aluminum and Stainless Steel dissolver products by the F-cell centrifuge system. The solids are transferred to the Process Equipment Waste System (PEW) where they have caused excessively high radioactivity concentration in the PEW evaporator overheads. This results in recycle of the evaporator overheads and accumulation of PEW evaporator feed. Shutdown of the dissolution processes is necessary whenever PEW evaporator feed surge capacity is exceeded. Isolation of a CPP Process Building waste tank to receive only F-cell solids waste is not possible with existing piping. In addition, if the solids could be directed to a single CPP Processing Building waste tank, there is still no way to transfer the solids to the waste system tank where there is some capability of mixing the solids (e.g. NWCF).

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

Present standards for radioactivity releases to the environment make future operation of the Stainless Steel process impractical. If the standards are tightened further, operation of the aluminum process may also be restricted.

IMPACT: The Stainless Steel dissolution process must be operated in FY-88 without the F-cell centrifuge system. This will result in extraction column plugging, poor product quality, a severe decontamination problem after the campaign, and a considerable increase in liquid waste sent directly to the tank farm.

Computer Communications Network Mods $300

Any terminal or personal computer will have access to any host computer at the ICPP or EG&G computer center that is on the network.

Currently each computer terminal connected to the HP 3000 requires two pair of telephone lines. The network will allow all terminals to be connected to the host computers using a single, common coax cable. This will free up existing telephone lines and eliminate future requirements for additional telephone lines for data terminals.

Relocation of computer equipment (computers, terminals, printer) would no longer be considered a major endeavor. There are no extra costs for connecting communications devices to the host or terminals, the single coax wire will be accessible in any building.

Currently distance from the host computer is the limiting factor in data transmission speed. For example, a terminal in the Spent Fuel Storage Building runs at 2400 baud (bits per second); this

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

9. Purpose, justification of need for, and scope of project (Cont'd.)

equates to a 4 second time span to paint the CRT screen. The network will allow a device to communicate at a speed of up to 19,200 baud.

IMPACT: More telephone lines will be required for access to the host computers as more terminals and personal computers are purchased. However the number of lines available is limited and it is not cost effective to install more telephone lines.

There will be an ongoing expense of reconnecting computer terminals each time a person is relocated. This problem is compounded by the above item.

Access to more than one host computer is severely limited. Many terminal users have a need to access more than one host computer. Each connection to a different computer requires a separate set of telephone lines. Costs to install more telephone lines will increase.

Miscellaneous Minor GPP's $100

Each year small miscellaneous, but very important, minor GPP's are identified during the fiscal year. These are projects which require immediate attention. With all GPP funds previously committed, there are no funds remaining for such projects. This project will make funds available for implementing these small GPP's. The funding limit for each project is $25,000. Individual descriptions for these projects will be written as they are identified. Typical examples of minor GPP's are: evacuation alarms, fire alarms, process cell hatches, ceiling replacements, waste line installations, and small storage facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 87-D-146

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9. Purpose, justification of need for, and scope of project (Cont'd.)

Albuquerque.. $ 900

Laboratory Space, Plutonium Facility $900

This project would support plutonium scrap processing, molecular fluorination technology exchange, and the development and demonstration of improved plutonium process technology. A key aspect of these NMP Program activities is the requirement for adequate "cold" laboratory space in the plutonium facility. This required "cold" laboratory space is essential for the assembly, testing, and demonstration of gloveboxes, robotics, and other plutonium processing equipment prior to its insertion into the hot facility.

10. Details of cost estimate

It is not possible to provide a detailed cost estimate for this project. Cost estimates for general plant projects are normally included in the request for a construction directive after the need for the work has been established, the scope of the job determined, and the preliminary engineering completed.

11. Method of performance

Design will be on the basis of negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

Not required.

13. Narrative Explanation of Toal Project Funding and Other Related Funding Requirements
Not required.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Nuclear Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Reduced chemical discharges to process sewers
Richland, Washington

2. Project No. 87-D-149

3. Date A-E work initiated: 4th Qtr FY 1986 (PE&D)

3a. Date physical construction starts: 3rd Qtr FY 1987

4. Date construction ends: 2nd Qtr FY 1988

5. Previous cost estimate: None

6.

Current cost estimate:	$3,500
Less amount for PE&D	$ 350
Net cost estimate:	$3,150
Date: 4/85	

7. Financial Schedule:

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$3,150	$3,150	$3,150	$1,400
1988	0	0	0	1,750

8. Brief Physical Description of Project

The proposed project will provide engineered systems and facilities that will isolate chemical releases from the fuels processing building, tank farms, and pipe trench from the process sewers and will direct spills from these sources to a facility for treatment and subsequent disposal. The completion of this project will result in significantly reduced discharges of chemical wastes to the fuels manufacturing facility process sewers. The present process sewer system carries process discharge from the fuels manufacturing area to the Richland 300 Area process sewer system which flows into a 1000-ft ground disposal trench. At present, an acid or caustic chemical spill can be neutralized in place, but no means is now provided to recover or dispose of organic solvents discharged to the process sewers. Perchloroethylene and 1,1,1-trichloroethane are of particular concern because they are extremely hazardous in minute concentrations and they cannot be neutralized once discharged to the environment.

1. Title and location of project: Reduced chemical discharges to
process sewers
Richland, Washington

2. Project No. 87-D-149

8. Brief Physical Description of Project (Cont'd)

As it is now planned, the system will provide collection sumps, pumps, pipes, and holding tanks necessary to contain, transfer, and hold chemical spills prior to their treatment and disposal. Detectors in the pipe trench will be provided to detect spills. The chemical waste in the holding tanks will be removed, treated, or disposed of as required without allowing the waste to enter the ground, the process sewers, or the nearby river.

This project will provide a mixed ion exchange treatment facility where hazardous materials will be removed from waste streams. The ion exchange will remove heavy metals (such as lead and chromium) and radioactive materials (such as uranium and technetium). An activated carbon bed package will be provided to absorb the hydrocarbons (oil, grease, and perchoroethylene) that are present in the organic waste stream. The treatment facility will also be of adequate size to treat nitric acid scrubber water, solutions from chemical rinse tanks, and nitrate-nitrite salt removal tank process streams. Existing and new process tanks and equipment will be equipped with enclosures, electric power, alarms, drains, and instrumentation as required. All tanks, equipment, and facilities will be provided heating and ventilation for freeze protection, as required.

Retention dikes will be provided for the following:

Number	Size in Gallons	Major Contents
2	10,000	NaOH, 63950 lb
2	6,000	HNO3, 38500 lb
1	6,000	H2SO4, 85140 lb
2	2,000	Waste acid (HF, 360 lb; HNO3, 7200 lb; cupric nitrate, 7850 lb; uranyl nitrate)
1	1,800	U bearing (HNO3, 2700 lb; H2SO4, 9200 lb; uranyl nitrate, 3000 lb)
1	1,500	Neutralizer (NaOH, NaNO3, CuO)
1	900	Chemical mill (HNO3, H2SO4, uranyl nitrate)
1	660	Filter press feed (NaNOs, Na2SO4, NaOH, sodium diuranate)
1	580	Copper strip (HNO3, cupric nitrate, uranyl nitrate)
2	560	Filter press effluent (NaNO3, NaSO4, NaOH, sodium diuranate)
4	470	Zr etch (HF, HNO3)
2	450	U bearing (HNO3, H2SO4, uranyl nitrate)

1. Title and location of project: Reduced chemical discharges to process sewers
Richland, Washington

2. Project No. 87-D-149

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8. Brief Physical Description of Project (Cont'd)

FY 1987 funds will be used for the completion of definitive design activities, procurement, and construction. Design will be initiated in FY 1986 through use of FY 1985 Plant Engineering and Design funds totalling $350,000.

9. Purpose, Justification of Need for, and Scope of Project

Separation of salt bearing and organic sewer streams will reduce the quantity of hazardous chemicals released to the environment. The present chemical processing areas, pipe trenches and most of the bulk chemical tanks have no spill prevention or retention provisions. Any chemical leaks or overflows discharge directly into the process sewer and trench system that enters the local water table and the nearby river via riverbank springs. Large quantities of acid entering the process sewer could lower the pH and solubilize the heavy metal precipitates (U, Cu, Cr, Mn, etc.) in the trench thereby causing the transport of these heavy metals into the river. Of particular concern is the accidental discharge of degreasing solvents (perchloroeythylene and 1,1,1-tricholorethane) and oils into the process sewer system. These solvents and oils have very low discharge limits and cannot be easily detected by monitoring devices.

Existing processing and storage tank capacities range from 100 gallons to 10,000 gallons and contain one or more of the following chemicals: nitric acid, sulfuric acid, hydrofluoric acid, sodium hydroxide, uranyl nitrate, cupric nitrate, perchloroethylene, and trichloroethane.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Reduced chemical discharges to
process sewers
Richland, Washington

2. Project No. 87-D-149

9. Purpose, Justification of Need for, and Scope of Project (Continued)

Environmental releases of reportable quantities of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) designated hazardous chemicals must be promptly reported to the National Response Center. Based upon past history (with no significant improvements in spill control), the operating contractor could experience two or three spills per year that must be reported according to CERCLA. As stated in CERLA, any waste generator responsible for such environmental releases is held responsible for clean up of the environment affected and may also be held liable for any damages.

Environmental regulations from other agencies are becoming more stringent. The State of Washington is becoming more active in regulating environmental releases within the Department of Energy sites. As they are now, process sewer discharges at the fuels manufacturing facility do not comply with limits given in certain portions of the Washington State Dangerous Waste Regulations. Prevention of hazardous chemical discharges to the process sewers will help achievement of compliance with State of Washington standards and will allow the contractor an advantage in meeting future stringent environmental regulations now anticipated.

If FY 1987 funds are not made available, the project will be delayed one year. Delays in funding will mean continued use of the present sewer system. Such use will expose the environment to potential damage and make the operating contractor and Department subject to unfavorable publicity, imposition of fines, and increased regulation by State agencies. Also, any waste generator is responsible for costs of clean-up and any damages awarded as a result of CERCLA violations. Continued discharge of hazardous chemicals and radioactive materials to the soil will eventually contaminate the ground water, a situation that will make the operating contractor and Department subject to penalties for violation of ALARA regulations and censure by the Environmental Protection Agency and State. Also, legal action could be initiated by the state or a public interest organization to shutdown fuel fabrication operations pending cessation of discharges.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reduced chemical discharges to process sewers
Richland, Washington

2. Project No. 87-D-149

10. Details of Cost Estimate a/

	Item Cost	Total Cost
A. Definitive design, field engineering and inspection at approximately 7% of construction costs, item b		$ 140 b/
B. Construction costs		2,400
Special facilities, process sewers	$2,400	
Subtotal		$2,540
C. Contingency at approximately 23% of above cost		610
Total estimated costs		$3,150

11. Methods of Performance

The project design will be under a negotiated architect-engineer contract. Construction and procurement will be accomplished by the onsite cost-plus-award-fee construction contractor because the system will be tied to existing process sewers and drains.

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a/ Based on completed conceptual design.

b/ Excludes $350,000 in FY 1985 PE&D funds to be used to initiate Definitive Design activities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reduced chemical discharges to process sewers Richland, Washington	2. Project No. 87-D-149

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
A. Total project costs						
1. Total facility costs						
(a) Construction line item	$ 0	$ 0	$ 0	$1,400	$1,750	$3,150
(b) PE&D..................	0	0	180	170	0	$ 350
(c) Inventories...........	0	0	0	0	0	0
Total direct costs....	$ 0	$ 0	$ 180	$1,570	$1,750	$3,500
2. Other project costs						
(a) R&D necessary to complete construction..	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
(b) Conceptual design costs	20	200	0	0	0	220
(c) Other project related costs..................	0	250	45	125	75	495
Total other project costs	$ 20	$ 450	$ 45	$ 125	$ 75	$ 715
Total project costs (Items 1 & 2)..........	$ 20	$ 450	$ 225	$1,695	$1,825	$4,215

B. Other related annual costs (estimated life of project: 20 years)

1. Facility operating costs..	$ 250
2. Programmatic operating expenses directly related to the facility.................	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility..	0
4. Maintenance, repair, GPP, or other construction related to programmatic effort for the facility..	0
Total related annual costs..	$ 250

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reduced chemical discharges to process sewers
Richland, Washington

2. Project No. 87-D-149

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project funding
   1. Total facility
      (a) Construction Line Item -These are funds to be used for definitive design, procurement, and construction.
      (b) PE&D - FY 1985 PE&D funds in the amount of $350,000 will be used to initiate Definitive Design activities
      (c) Inventories - None
   2. Other project funding
      (a) R&D necessary to complete construction - None
      (b) Conceptual design funding - Expense funds in the amount of $220,000 were used for conceptual design, including preparation of a cost estimate for project authorization and environmental documentation.
      (c) Other project related funding - Included are the costs of project management.

B. Total related funding requirements - It is estimated that the new process sewer systems will be used for up to 20 years for programmatic purposes.

   1. Facility operating costs - These costs include the annual costs for operating, ard maintaining monitoring equipment and for purchase of spare parts.

   2. Programmatic operating expenses directly related to the facility - None

   3. Capital equipment not related to construction but related to the programmatic effort in the facility - None

   4. Maintenance, repair, GPP, and other construction related to programmatic effort - None

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Nuclear Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Radioactive liquid effluent
Treatment facility (partial design only)
Richland, Washington

2. Project No. 87-D-150

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3. Date A-E work initiated: 1st Qtr. FY 1987

3a. Date physical construction starts: 2nd Qtr. FY 1989

4. Date construction ends: To be determined

5. Previous cost estimate: None

6. Current cost estimate: $4,000 a/
Less Amount for PE&D 0
Net cost estimate: $4,000
Date: 3/85

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7. Financial Schedule:

Fiscal Year	Authorization	Appropriations	Obligations	Costs
1987	4,000	4,000	4,000	3,000
1988	0	0	0	1,000

8. Brief Physical Description of Project

The proposed radioactive liquid effluent treatment project will provide a facility and all necessary equipment to treat radioactive liquid effluents now generated during normal operation of the Richland (RL) N Reactor. The proposed project will provide for the disposal of separated waste and partial recycle of demineralized water to the primary reactor coolant loop. In addition, this project will provide the necessary shielding to protect the environment and operating personnel from exposure to radiation hazards.

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a/ Partial design only; total cost of project will be approximately $85,000,000.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project:	Radioactive liquid effluent treatment facility (partial design only) Richland, Washington	Project No. 87-D-150

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8. Brief Physical Description of Project (cont'd)

As presently envisioned, the treatment plant will be a reinforced concrete structure capable of shielding the environment from radioactive releases; this facility will segregate the liquid waste streams and process equipment from the ventilation and control facilities. The facility walls will be designed such that radionuclide releases from fuel failures will not escape the treatment plant. Instrumentation will be provided in the facility for process control and monitoring in accordance with technical requirements.

FY 1987 funds will be used to initiate definitive design activities.

9. Purpose, Justification of Need for, and Scope of Project

The purpose of this project is to provide a treatment facility that will remove radioactive materials from process streams generated at the reactor. The facility will treat the streams so effectively that demineralized water may be recycled into the primary loop, radioactive liquid discharges to soil columns will be greatly reduced, and Department of Energy requirements concerning replacement of disposal to soil columns will be fulfilled.

The practice of using soil columns for the treatment of radioactive liquid wastes is being discontinued at Department of Energy sites. Current Department policy requires that other techniques be implemented for the treatment of low level waste generated at the N Reactor. No alternative other than disposal to the soil column is now available at the reactor site. The proposed radioactive liquid effluent treatment facility will provide a replacement to normal disposal to the soil column.

Operation of the proposed facility will allow other reactor systems to function more efficiently. Demands on the demineralized water treatment plant capacity will decrease markedly because demineralized water can be recycled to the primary loop from the radioactive liquid effluent treatment facility. Associated operating costs for the demineralized water treatment plant will be reduced. The trench and soil column will no longer be used for processing normal radioactive liquid effluent, significantly reducing the potential for release to the environment.

If this project is not funded, the discharge of liquid effluent to the soil column will continue. Prohibition of all discharges to the soil column without exception would cause a reactor shutdown with a resulting loss of production and steam revenues.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project:	Radioactive liquid effluent treatment facility (partial design only) Richland, Washington	2. Project No. 87-D-150

10. Details of Cost Estimate [a/]

	Item Cost
A. Definitive design (partial)	$ 4,000

11. Method of Performance

The project design will be performed under a negotiated architect-engineer contract with an architect-engineer experienced in water treatment. To the extent feasible, construction will be accomplished by fixed price contracts and subcontracts awarded on the basis of competitive bidding.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

A. Total project costs	Prior Years	FY 1987	FY 1988	Total
1. Total facility costs				
(a) Construction line item. . . .	$ 0	$3,000	$1,000	$ 4,000
(b) PE&D.	0	0	0	0
(c) Inventories	0	0	0	0
Total direct costs.	$ 0	$3,000	$1,000	$ 4,000
2. Other project costs				
(a) R&D necessary to complete construction.	$ 0	$ 0	$ 0	$ 0
(b) Conceptual design costs . . .	900	$ 0	$ 0	$ 900
(c) Other project related costs .	450	570	785	1,805
Total other project costs . .	$1,350	$ 570	$ 785	$ 2,705
Total project costs (Item 1 & 2).	$1,350	$3,570	$1,785	$ 6,705

B. Other related annual costs (estimated life of project: 20 years)	
1. Facility operating costs	$ 3,000
2. Programmatic operating expenses directly related to the facility	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility .	0
4. Maintenance, repair, GPP, or other construction related to programmatic effort in the facility	0
Total related annual costs	$ 3,000

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a/ Funding needs for years beyond FY 1987 will be identified based upon completed conceptual design. Conceptual design is scheduled for completion in FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Radioactive liquid effluent
treatment facility (partial design only)
Richland, Washington

Project No. 87-D-150

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project funding
   1. Total facility
      (a) Construction Line Item - These funds will be used for partial definitive design of the facility.
      (b) PE&D - none.
      (c) Inventories - none.

   2. Other project funding
      (a) R&D necessary to complete construction - none.
      (b) Conceptual design funding - Expense funds in the amount of $900,000 are required for completion of conceptual design, including preparation of a cost estimate for project authorization.
      (c) Other project related funding - Included are the costs of project management.

B. Total related funding requirements - It is estimated that the radioactive liquid effluent treatment facility will be used for 20 years for its programmatic purposes.

   1. Facility operating costs - These costs include the annual costs for operating and maintaining the effluent treatment facility and for purchase of spare parts.

   2. Programmatic operating expenses directly related to the facility - none.

   3. Capital equipment not related to construction but related to the programmatic effort in the facility - none.

   4. Maintenance, repair, GPP, or other construction related to the programmatic effort in the facility - none.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Environmental protection, plantwide
Savannah River, South Carolina

2. Project No.: 87-D-152

3. Date A-E initiated: 3rd Qtr. FY 1987

3a. Date physical construction starts: 1st Qtr. FY 1988

4. Date construction ends: 4th Qtr. FY 1989

5. Previous cost estimate: None

6.		
	Current cost estimate:	$ 6,500
	Less amount for PE&D	0
	Net cost estimate	$ 6,500
	Date: 6/85	

7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 1,500	$ 1,500	$ 1,500	$ 300
1988	2,800	2,800	2,800	3,800
1989	2,200	2,200	2,200	2,400

8. Brief Physical Description of Project

This project provides facilities to prevent spills of hazardous and/or radioactive materials into groundwater or surface waters of the state of South Carolina. The facilities are varied and involve many different areas. Work includes:

- Spill containment for miscellaneous powerhouse and water treatment plant equipment in ten operating areas.
- Installing instrumentation on all hazardous chemical tanks greater than 1,000 gallon capacity to monitor tank level and alarm at high level in six operating areas.
- Rerouting demineralizer neutralization waste to ash basins; three operating areas.
- Curbed 1800 square foot buildings for storage of drums of hazardous or radioactively contaminated wastes in each of the four reactor areas.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental protection, plantwide
Savannah River, South Carolina

2. Project No.: 87-D-152

8. Brief Physical Description of Project (continued)

- o A waste collection tank with auxiliary oil decanting, drum unloading and truck loading facilities in each of the four reactor areas.
- o Upgrading and adding spill containment facilities for the large chemical storage tanks in F and H Areas.

The materials to be contained are inorganic acids, caustic, tributyl phosphate, uranyl nitrate, miscellaneous inorganic chemicals and water contaminated with low level radioactivity and/or oil.

FY 1987 funds will be used for initial design, long-lead procurements, and placement of building contracts.

9. Purpose, Justification of Need for, and Scope of Project

The facilities proposed in this project are needed to prevent contamination of groundwater or surface waters of the state with radioactive and/or hazardous materials. DOE Order 5480.1A and the South Carolina NPDES Permit for the Savannah River Plant require protection against spills or leaks contaminating waters of the State.

Without the proposed facilities there is a potential for contaminating waters of the state. Failure to provide, or delaying the installation of, the proposed facilities subjects the environment to potential contamination and subjects DOE to possible punitive action by the state.

The Department has made commitments to the State of South Carolina that cleanup of spills at the Savannah River Plant will not be delayed. Show cause orders are still being negotiated with the State on previous spills. Significant spill problems have been experienced in the past and the problem continues. If funding for the proposed facilities is delayed, there is a potential of being fined by the State.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental protection, plantwide
Savannah River, South Carolina

2. Project No.: 87-D-152

10. Details of Cost Estimate a/

		Item Cost	Total Cost
A. Engineering design at approximately 12% of item B			$ 550
B. Construction costs			4,672
1. Buildings		$ 692	
a. Curbed storage buildings 4 @ 30x60x18	$ 515		
b. Oil drum storage 8 @ 8x10x8 ft	65		
c. Additional lighting & electrical service	112		
2. Special facilities		$ 3,676	
a. Equipment	$ 1,375		
b. Power wiring	170		
c. Instrumentation - Includes computer hardware & software interfacing	610		
d. Piping & insulation	.1,521		
3. Standard equipment		2	
4. Improvements to land - sidewalks, curbs, & paving		290	
5. Utilities - railroads		12	
C. Removal cost			153
Subtotal			$ 5,375
D. Contingency at approximately 18% of above cost			975
F. Design and construction liaison, testing, checkout, and acceptance			150
Total Estimated Cost			$ 6,500

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a/ The above estimates are based on completed conceptual design and feasibility studies.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental protection, plantwide
Savannah River, South Carolina

2. Project No.: 87-D-152

11. Method of Performance

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

Prior Years	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	Total
A. Total Project Costs						
1. Total facility costs						
a. Construction line item	$ 0	$ 0	$ 300	$ 3,800	$ 2,400	$ 6,500
b. PE&D	0	0	0	0	0	0
c. Expense funded equipment	0	0	0	0	0	0
d. Inventories	0	0	0	0	0	0
Total facility costs	$ 0	$ 0	$ 300	$ 3,800	$ 2,400	$ 6,500
2. Other Project Costs						
a. R&D	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
b. Conceptual design	120	0	0	0	0	120
c. Other project related costs	50	175	25	0	0	250
Total other project costs	$ 170	$ 175	$ 25	$ 0	$ 0	$ 370
Total project costs (Item 1 & 2)	$ 170	$ 175	$ 325	$ 3,800	$ 2,400	$ 6,870

B. Other related annual costs (estimated life of project: 25 years)

	Annual Cost
1. Facility operating costs	$ 20
2. Programmatic operating expenses directly related to the facility	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	0
Total other related annual funding requirements	$ 20

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental protection, plantwide
   Savannah River, South Carolina

2. Project No.: 87-D-152

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project costs
   1. Total Facility Costs
      a. Construction line item - No narrative required
      b. PE&D - None
      c. Expense funded equipment - None
      d. Inventories - None
   2. Other project costs
      a. R&D necessary to complete construction - None
      b. Conceptual design - No narrative required.
      c. Other project related costs - Engineering studies

B. Total related annual costs
   1. Facility operating costs - Added utility and maintenance costs
   2. Programmatic operating expenses directly related to the facility - None
   3. Capital equipment not related to construction but related to the programmatic effort in the facility - None
   4. GPP or other construction related to programmatic effort - None
   5. Other costs - None

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands Narrative material in whole dollars)

1. Title and location of project: Reactor effluent cooling water thermal mitigation
Savannah River, South Carolina

2. Project No.: 87-D-156

3. Date A-E work initiated 2nd Quarter FY 1987

3a. Date physical construction starts: 4th Quarter FY 1987

4. Date construction ends: 4th Quarter FY 1989

5. Previous cost estimate None

6. Current cost estimate $109,000
Less amount for PE&D: 0
Net cost estimate: $109,000
Date: 6/85

7. Financial Schedule

Fiscal Year	Authorization	Appropriations	Obligations	Costs
1987	$ 5,000	$ 5,000	$ 5,000	$ 5,000
1988	67,200	67,200	67,200	65,000
1989	36,800	36,800	36,800	39,000

8. Brief Physical Description of Project

This project will provide thermal mitigation systems for the effluent cooling water from C and K reactors. Each system will consist of a once-through forced draft cooling tower and a holding basin installed in series. The cooling towers will be approximately 300 feet in diameter with twenty-four, 32-foot diameter fans driven by 200 hp motors. The basins will be sized to provide a 24 hour thermal equalization period, at a nominal effluent flow of approximately 175,000 gpm, to prevent sudden changes in the discharge temperatures to the streams. Each system will require a 60 foot deep concrete pump pit, six 37,000 gpm pumps, and new 72" interconnecting piping. A pond outlet structure and discharge pipe will also be constructed to control discharges to the effluent stream.

1. Title and location of project: Reactor effluent cooling water thermal mitigation
Savannah River, South Carolina

2. Project No.: 87-D-156

8. Brief Physical Description of Project (Cont'd)

Electrical services to the reactor areas will be expanded to supply the additional load imposed by the cooling towers and pumps. Approximately 6.5 miles of high capacity overhead cabling will be installed together with new transformers. Two 600 square foot building additions will be required for the transformers.

A new 3,000 square foot control building will be erected to house the switchgear and instrumentation necessary for operation of the towers and their associated pumps. Instrumentation will be provided to measure and record discharge temperatures from the towers and basins. Backup controls will be provided in the existing central reactor control room.

The holding basins will have earth walls with concrete mixing baffles and headwalls. About 2 miles of electrical power lines will have to be relocated to provide clear space for the basins. Site work will consist of approximately 700 feet of paved service road and 8,000 feet of lighting and fencing in each area.

9. Purpose, Justification and Need for, and Scope of Project

The objective of this project is to provide thermal mitigation of the effluent from C and K reactors to bring the cooling water discharges into compliance with current South Carolina requirements. The proposed cooling systems will reduce the current water discharge temperature of about 170°F to less than or equal to 90°F (32.2°C) in accordance with the Water Classification Standards System of the State of South Carolina.

In January 1984, DOE and the South Carolina Department of Health and Environmental Control (SCDHEC) signed a consent order allowing the continued discharge of hot water effluent into tributaries of the Savannah River if DOE would complete and submit thermal mitigation studies and a recommended course of action to SCDHEC within 9 months of signing the order. In this study, which was completed in September 1984, 27 thermal mitigation alternatives for C and K Areas were evaluated. These ranged from various sized cooling ponds to recirculating and once-through towers. On the basis of cost, schedule, and minimal environmental impact, DOE recommended once-through cooling towers with a small off-stream discharge pond as the preferred alternative. In March 1985, SCDHEC completed their review of the DOE study and agreed that the chosen alternative was adequate to meet state standards.

CONSTRUCTION PROJECT DATA SHEETS

1.	Title and location of project:	Reactor effluent cooling water thermal mitigation Savannah River, South Carolina	2. Project No.: 87-D-156

9. Purpose, Justification and Need for, and Scope of Project (Cont'd)

This project represents the current DOE preferred alternative, but the decision on the selection and implementation of the alternative cooling water systems will have to be accomplished in accordance with the National Environmental Policy Act. This action is required by the NPDES Consent Order between the DOE and the South Carolina Department of Health and Environmental Control (SCDHEC) and is necessary to bring the cooling water discharges into compliance with the Federal Water Pollution Control Act, as amended by the Clean Water Act. The preferred alternative must have the concurrence of the SCDHEC.

Fiscal year 1987 project funds will be used for engineering design.

10. Details of Cost Estimate [a/]

		Item Cost	Total Cost
A. Engineering design at approximately 8% of construction costs Item B			$ 6,600
B. Construction costs			84,400
1. Improvements to land		$ 0	
2. Buildings		2,180	
a. Control houses (113-CK) 68'x44'-1 story	$ 1,560		
b. Control houses addn. (151-3KC) 30'x20'-1 story	310		
c. Control houses addn. (151-4KC) 30'x20'-1 story	310		
3. Other structures		58,550	
a. CW pump pits (111-KC)	5,690		
b. Cooling towers (112-KC)	42,660		
c. Holding ponds, KC (689G) (688G)	10,200		
4. Special facilities		23,670	
a. Equipment	6,290		
b. Piping	2,820		
c. Instruments	1,000		
d. Electrical	13,560		
C. Major computer items			0
D. Removal cost			440
Subtotal			$ 91,440

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a/ The above estimates are based on completed conceptual design and feasibility studies.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Reactor effluent cooling water thermal mitigation
Savannah River, South Carolina

2. Project No.: 87-D-156

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10. Details of Cost Estimate (Cont'd)

E. Contingency at approximately 18% of above costs	16,560
F. Design and construction liaison, testing, checkout and acceptance	1,000
Total Estimated Costs	$109,000

11. Method of Performance

Design and inspection shall be performed partially by the operating contractor and partially under a negotiated engineer contract. Construction and procurement shall be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded by competitive bidding to the extent feasible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
A. Total project costs					
1. Total facility costs					
a. Construction line item	$ 0	$ 5,000	$65,000	$39,000	$109,000
b. PE&D	0	0	0	0	0
c. Expense funded equipment	0	0	0	0	0
d. Inventories	0	0	0	0	0
Total facility costs	$ 0	$ 5,000	$65,000	$39,000	$109,000
2. Other project costs					
a. R&D	0	0	0	0	0
b. Conceptual design and eng. studies	1,020	200	0	0	1,220
c. Other project related costs	1,550	0	0	0	1,550
Total other project costs	2,570	200	0	0	2,770
Total project costs (Item 1 & 2)	$ 2,570	$ 5,200	$65,000	$39,000	$111,770

1. Title and location of project: Reactor effluent cooling water
thermal mitigation
Savannah River, South Carolina

2. Project No.: 87-D-156

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12. Funding Schedule of Project Funding and Other Related Funding Requirements (Cont'd)

B. Other Related Annual Costs (estimated life of project: 15 years) b/

	Annual Cost
1. Facility operating costs	$7,900
2. Programmatic operating expenses directly related to the facility	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	0
Total other related annual funding requirements	$7,900

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project costs
  1. Total Facility Costs
    a. Construction line item - No narrative required
    b. PE&D - None
    c. Expense funded equipment - None
    d. Inventories - No inventories are needed for the proposed facilities.
  2. Other project costs
    a. R&D - None
    b. Conceptual design and engineering studies - Includes soil investigations, bid solicitation, survey of cooling tower constructors, preparation of Conceptual Design Report and cost estimate. Conceptual Design Report and Current Appraisal of Cost Estimate.
    c. Other project related costs - Funded from operating costs, include the preparation of the Environmental Impact Statement (EIS), estimated at $1,500,000 and the Safety Analysis Report, estimated at $50,000.

B. Total related annual costs
  1. Facility operating costs - Includes electric power for pump and fan operation; operations, maintenance, and health protection labor; and chemical treatment cost.
  2. Programmatic operating expenses directly related to the facility - None
  3. Capital equipment not related to construction but related to the programmatic effort in the facility - None
  4. GPP or other construction related to programmatic effort - None
  5. Other costs - None

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b/ FY 1990 dollars

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and location of project: Environmental, health, and safety improvements Phase I, Feed Materials Production Center, Fernald, Ohio

2. Project No.: 87-D-159

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3. Date A-E work initiated: 1st. Qtr. FY 1987

3a. Date physical construction starts: 3rd Qtr. FY 1987

4. Date construction ends: 4th Qtr. FY 1992 a/

5. Previous cost estimate: None

6. Current cost estimate: $ 60,000 a/
Less amount for PE&D 0
Net cost estimate $ 60,000
Date: 6/85

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7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 10,000	$10,000	$10,000	$ 6,000
1988	21,000	21,000	21,000	12,400
1989	14,000	14,000	14,000	17,400
1990	9,000	9,000	9,000	16,800
1991	6,000	6,000	6,000	5,400
1992	0	0	0	2,000

a/ Preliminary estimates for Phase I only. The total project is expected to in the range of $200 to $300 million. Definitive figures will be provided after completion of environment studies and conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, health, and safety improvements Phase I, Feed Materials Production Center, Fernald, Ohio

2. Project No.: 87-D-159

8. Brief Physical Description of Project [b/]

This project provides a series of improvements that will reduce uranium discharges from the Feed Materials Production Center (FMPC) and ensure that plant operations do not pose a threat to the environment, the community, or the work force. Problems experienced at the plant over the past few months mandate that the Department proceed with these improvements in an expeditious manner; therefore, initial project funding is being sought for the highest priority needs prior to the completion of pollution path studies and conceptual design. The scope of work described in this document encompasses those items believed most likely to be included in Phase I, but is not final. Necessary revisions will be identified during the FY 1987 congressional hearings and a more detailed scope description will be included in next year's budget submission.

Prevention of Water Contamination

It is estimated that approximately 75,000 kilograms of uranium has entered Paddy's Run Creek and other surface streams as a result of FMPC operations. A portion of this material has percolated into the groundwater and is suspected to be the source of the uranium contamination recently detected in three offsite wells.

One of the means by which uranium reaches the off-site streams is through rain water contact with the 65,000 drums of uranium bearing solids being held in out-of-door storage yards in various sections of the FMPC site. Uranium dust on the exterior surfaces of these drums is washed off by rainfall and eventually mitigrates to the streams. Accidental spills or leakage from the drums can be similarly transported with resulting contamination spread.

Equipment and facilities will be installed as part of Phase I to either eliminate or safely isolate those drums currently stored in the vicinity of Plants 2, 4, 8, and 9 from the environment. Elimination of the drums is preferred; however, a practical means of achieving this has not yet been identified. The estimate is, therefore, based on the construction of curbed, weather tight storage buildings sized to hold the total numbered of drums now in existence.

Some of the soil under the existing drum storage areas, and other plant areas, is contaminated as a result of past spills. This soil will be removed, where necessary, to prevent further leaching.

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b/ Reflects current intent only. Final scope will be established after resolution of environmental issues in accordance with National Environmental Policy Act requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, health, and safety improvements
Phase I, Feed Materials Production Center,
Fernald, Ohio

2. Project No.: 87-D-159

8. Brief Physical Description of Project (Continued)

Water contamination can also occur as the result of extended rain water contact with finished uranium metals. Several hundred pallets of finished and reject uranium metal are currently stacked in outside locations due to the lack of interior storage space. This will be corrected through the construction of several small storage buildings. The storage buildings will be of rigid metal frame design with prefinished insulate metal siding and concrete slab floors. Lighting, heating, and fire protection will be provided.

Reduction of Atmospheric Emissions

Exhaust stack discharges have historically been the largest single source of radionuclide emissions from the FMPC. A number of dust filtration systems have already been upgraded in order to curtail these losses; however, additional work is required.

New higher efficiency dust collection systems will be installed on those remaining processes in Plants 1, 5, and 8 determined to be a source of off-site uranium contamination. High efficiency particulate air (HEPA) filters, bag filters or packed column scrubbers will be utilized depending on the properties of the exhaust gas involved and the quantity of radionuclide particulates present. The existing exhaust fans will have to be upgraded to compensate for the larger pressure drops and increased ventilation capacities that will be required for these new systems. Some structural and electrical modifications will also be necessary.

Building ventilation systems will be modified to reduce the buildup of aerosols or gases in the work areas and limit the spread of radiation in the event of an accidental spill. New ducting, fans, and controls will be installed, as necessary, to achieve proper air flow balances. Filters will be installed on building exhausts, where appropriate, to ensure that uranium dust is not discharged to the environment.

Separation of Clean and Contaminated Work Areas

The geographical arrangement of facilities at the FMPC makes contamination control difficult in that uranium can easily be tracked out-of-doors and there is not a clear separation of clean and dirty functions. The total work force utilizes a single change and shower facility located at the front of the plant. This facility is a significant distance from the various processing buildings and is accessible only by walking outside. If an employee has picked up uranium dust on either his company supplied work shoes or coveralls, it can brush off while he is in transite to the change facility. Radiation levels on the pathway leading into the change facility are significantly above background; indicating that material is inadvertantly being tracked from the process buildings.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, health, and safety improvements
Phase I, Feed Materials Production Center,
Fernald, Ohio

2. Project No.: 87-D-159

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8. Brief Physical Description of Project (Continued)

Radiation monitoring equipment and small auxilary change rooms will be installed at the main egress points of the processing buildings as partial solution to this problem. These will allow abnormally contaminated clothing to be intercepted before the employees leave the buildings and help to reduce the spread of uranium.

A number of modifications will also be made to clarify the boundary line between the clean and dirty portions of the site. These improvements will include: additional fencing, one-way turnstiles, the relocation of building doorways, a new freight elevator on the southwest side of the service building, and construction of a visitor's change room.

There is only one truck entrance into the site at the present time. Vendor's delivering raw materials to buildings located at the rear of the plant must cross the processing area on the same roads used to move uranium between various buildings. This results in an unnecessary potential for tracking of uranium off of the FMPC by these vehicles.

A new truck access road will be constructed outside of the processing area of the plant as part of Phase I to give a clean route to the north side of the site. Approximately 5,000 feet of drainage ditchwork, fencing and street lighting will be required for this road. A new guard station will be constructed at the entrance of the road in order to ensure adequate security.

A new dual entry warehouse will be built off of the new access road to serve the adjacent processing buildings. The warehouse will allow incoming materials to be unloaded and then transferred to the processing area without cross contamination. It is expected to be a prefabricated structural steel facility about 12,000 sq. ft. in size.

Air Samplers

Additional ambient air monitoring stations will be installed at selected off-site locations for verification of dose exposures to the public.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, health, and safety improvements
Phase I, Feed Materials Production Center,
Fernald, Ohio

2. Project No.: 87-D-159

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8. Brief Physical Description of Project (Continued)

Emergency Alarm Systems

FMPC employees are currently notified of emergency conditions through a system that uses coded horn blasts followed up by individual supervisory contact. This system is slow, subject to misinterpretation, and is not audible in all portions of the site. A new alarm and public announcement system will be installed as part of Phase I to ensure rapid, accurate communication. An off-site siren system will also be installed to notify the local community of emergencies requring immediate evacuation. The sirens will be augmented by a computer controlled automatic dialing telephone system that will be preprogrammed to notify state agency, and local officials of emergencies that affect the surrounding area.

ES&H Buildings

Office and laboratory space at the FMPC is extremely limited and is not adequate to accommodate the additional environmental, safety, and health functions that must now be performed. New space will, therefore, be provided under Phase I to meet these needs. This includes: a 12,000 square foot addition for employee medical services; approximately 20,000 square feet of analytical area; and, a 4,000 square foot Emergency Operations Center. All three buildings will be of masonry block construction.

Noncontaminated Solid Waste

Flyash from the FMPC boiler plant is currently stored in open outdoor piles. An engineered land fill is required to properly dispose of this, and other, noncontaminated solid waste. Such a landfill will be constructed as part of Phase I. It will be approximately 500,000 cubic foot in size. Permanent water sampling wells will be installed around the landfill to comply with Ohio EPA requirements.

Future Phases

Approximately $140 to $240 million dollars of additional work will be performed in the remaining phases of this project. The scope of these phases is highly dependent upon the outcome of currently ongoing environmental, health, and safety studies and the agreements to be reached with the many regulatory agencies involved. Work is expected to be included further cleanup of the liquid process effluent streams, controlled storage pads for Plant 1, final upgrades to the air cleaning systems, and the automation or modification of additional processes in order to reduce direct employee contacts with uranium. If, during the course of conceptual design, the benefits of any of these future tasks are determined to be greater than those obtainable, from the Phase I tasks current listed, the sequence of work will be rearranged.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, health, and safety improvements
Phase I, Feed Materials Production Center,
Fernald, Ohio

2. Project No.: 87-D-159

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9. Purpose, Justification of Need For, and Scope of Project

The measures provided by this project are required for the improved containment of radionuclides and other pollutants that are potentially hazardous to the environment, FMPC employees, and the public. Large tonnages of both depleted and slightly enriched uranium are processed at the FMPC daily with the resulting generation of undesirable effluents. Ingestion or inhalation of these effluents can pose a health risk; therefore, human exposures must be kept as low as reasonably achievable.

The effluent control systems in use at the FMPC were designed 25 years ago in a period of far more lenient environmental regulations. Removal efficiencies for respirable size particles are less than what could be obtained with state-of-the-art equipment. Also, there is generally only one containment barrier. This means that, if a component fails, it is possible for large quantities of contaminants to be released before an operator can intercede.

These deficiencies have led to a total of 170,000 kilograms of uranium being dispursed to the surrounding environs since 1952. Air, water, and soil samples taken at off-site locations all show above background concentrations of radionuclides as a result of plant operations.

The large scale release of pollutants from the FMPC has evoked considerable adverse sentiment from the U.S. Congress, Federal and State regulatory agencies, the media, and the public during the past half-year. The State of Ohio has filed a Notice of Intent to sue pursuant to Section 7002 of the Resource Conservation and Recovery Act. The U.S. Environmental Protection Agency is undertaking an investigation of the plant and has identified a list of major concerns related to radiation emissions and monitoring. The U.S. House of Representatives Subcommittee on Oversight and Investigation (Energy and Commerce) has indicated a concern and requested complete information. The U.S. Senate Committee on Government Affairs has conducted local hearings to explore the management of health and safety at the FMPC. The unions representing the employees at the FMPC have requested the National Institute for Occupational Safety and Health to investigate a list of issues. The plant has been the subject of adverse national radio and television news network coverage. And, local residents have initiated lawsuits against the Department of Energy and its current operating contractor.

In addition to their direct impact on health and safety, the adequacy of the FMPC's containment systems has an indirect bearing on the achievement of nuclear materials production goals. Two major production processes--Plants 5 and 9-- had to be partially shut down for 5 months this year because required effluent capture ratios could not be guaranteed. Similar shutdowns are possible in the future, with accompanying impacts on nuclear materials outputs, if radionuclide discharge problems cannot be corrected.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Environmental, health, and safety improvements
Phase I, Feed Materials Production Center,
Fernald, Ohio

2. Project No.: 87-D-159

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10. Details of Cost Estimate b/

	Item Cost	Total Cost
A. Engineering, Design, and Inspection at approximately 20% of Construction Costs, Item B		$ 8,000
B. Construction costs		40,500
1) Building Modifications	$12,000	
2) Other Structures	4,000	
3) Special Facilities	24,500	
Subtotal		$ 48,500
C. Contingency at approximately 24% of above costs		11,500
Total Project Cost		$ 60,000

11. Method of Performance

Design and inspection will be performed by a negotiated architect-engineer and/or the management and operating contractor. Construction and procurement will be accomplished by the management and operating contractor, utilizing fixed-price subcontracts to the extent feasible, awarded on the basis of competitive bids.

b/ The above cost estimate is based on limited conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, health, and safety improvements Phase I, Feed Materials Production Center, Fernald, Ohio

2. Project No.: 87-D-159

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	Total
A. Total Project Costs								
1) Total Facility Costs								
a) Construction line item..	$ 0	$6,000	$12,400	$17,400	$16,800	$5,400	$ 2,000	$60,000
b) PE&D	0	0	0	0	0	0	0	0
c) Expense funded equipment	0	0	0	0	0	0	0	0
d) Inventories............	0	0	0	0	0	0	0	0
Total Facility Costs	$ 0	$6,000	$12,400	$17,400	$16,800	$5,400	$ 2,000	$60,000
2. Other Project Costs c/								
a) R&D necessary to complete construction ..	0	500	600	600	600	0	0	2,300
b) Other project related costs	2,500	0	0	0	0	0	0	2,500
Total Other Project Funding	2,500	500	600	600	600	0	0	4,800
Total Project Costs	$ 2,500	$6,500	$13,000	$18,000	$17,400	$5,400	$ 2,000	$64,800

c/ For total project. Cost indicated under 12.A.1) are for Phase I only.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental, health, and safety improvements Phase I, Feed Materials Production Center, Fernald, Ohio

2. Project No.: 87-D-159

12. Funding Schedule of Project Funding and Other Related Funding Requirements (Continued)

B. Total Annual Related Funding Requirement (Estimated Life of Project: 25 to 40 Years)

1) Facility Operating Costs	$ 0
2) Programmatic Operating Expenses Directly Related to the Facility	0
3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0
4) GPP or Other Construction Related to Programmatic Effort in the Facility	0
5) Other Costs	0
Total Other Related Annual Funding Requirements	$ 0

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total Project Funding Costs
  (1) Total Facility
    a. Construction line item -- No narrative required.
    b. PE&D -- None.
    c. Expense funded equipment -- None
    d. Inventories -- None
  (2) Other Project Funding
    a. R&D necessary to complete construction -- technical studies and preparation of baseline documentation
    b. Other project related costs -- Conceptual design costs.

B. Total Annual Related Funding Requirements -- there will be no significant change to costs as a result of this project.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Productivity retention program, Phases I & II, Various Locations

2. Project No. 86-D-149

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3. Date A-E Initiated: 1st Qtr. FY 1986

3a. Date Physical Construction Starts: 2nd Qtr. FY 1986

4. Date Construction Ends: 2nd Qtr. FY 1993 a/

5.

Previous Cost Estimate:	$213,000
Less Amount for PE&D:	0
Less nonfunded equipment transfer:	2,500
Net Cost Estimate:	$210,500
Date: 12/84	

6.

Current Cost Estimate:	$286,400 a/
Less Amount for PE&D:	0
Less nonfunded equipment transfer	4,300
Net Cost Estimate:	$282,100
Date: 6/85	

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7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	24,200	20,700	20,700	14,960
1986 Sequestered	0	(1,100)	(1,100)	(600)
1987	71,625	76,225	76,225	61,080
1988	95,130	95,130	95,130	90,100
1989	48,965	48,965	48,965	61,350
1990	28,665	28,665	28,665	32,780
1991	9,090	9,090	9,090	11,750
1992	1,275	1,275	1,275	7,380
1993	3,150	3,150	3,150	3,300

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a/ Change results from addition of Phase II, cost savings on some Phase I subprojects, and deletion of three unfunded Phase I subprojects.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II
Various Locations

2. Project No. 86-D-149

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8. Brief Physical Description of Project

This project provides for modernization and upgrading of existing nuclear materials production facilities at Savannah River, South Carolina; Fernald, Ohio; and Richland, Washington. Specific subprojects include:

a. Replace Thermal Diffusion Columns, SR (TEC $4,100,000; FY 1987 BA $2,100,000[b])

This Phase I subproject provides an isotope separation process capable of replacing the aging thermal diffusion column process for separating gaseous hydrogen isotopes. The new process will be based on recently developed technology which uses two alternately heated and cooled palladium filled beds. Various pumping systems, storage tanks, valving, and a tritium-safe ventilated hood will be included to support the isotope separation process. All components will be installed in an existing building. Fiscal Year 1987 funds will be utilized to complete procurement and construction.

b. JB-line Productivity Retention, SR (TEC $70,000,000; FY 1987 BA $12,865,000)

This Phase I and II subproject provides for replacement of existing plutonium finishing components of the JB-line in Building 221-F. Phase I tasks include:

- Replace the two M-6 furnaces with new furnaces utilizing dielectric drying technology
- Replace the cation rotameter cabinet
- Automate a portion of the cation exchange process
- Rework the C-7 wet cabinet to improve ventilation and replace windows
- Upgrade and automate the mechanical line
- Provide a new distributive control system
- Remodel the south end standard structure to provide equipment access, new offices, storage area and rest room facilities
- A new vessel vent system
- Replace corroded ventilation duct work

Phase II tasks include:

- Replacement of pickling, end dumper, and finishing section of the mechanical line.
- Installation of a new solid waste packaging system.
- Automation of cation system operations.
- An expanded Distributed Control System.
- A high volume air monitoring system.
- Replacement of Precipitator Concentrate Feed Tank M-1, Filtrate Transfer Tank M-35, Flush Dissolver Adjustment Tank D-4, and associated equipment.

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b/ FY 1987 subproject BA's developed prior to FY 1986 Gramm-Rudman-Hollings reductions. Allocation between subprojects may change.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II
Various Locations

2. Project No. 86-D-149

8. Brief Physical Description of Project (continued)

The FY 1987 funds will be used to continue design and initiate procurement and construction.

c. Replace Hot Canyon Cranes, SR (TEC $29,000,000; FY 1987 BA $11,080,000)

This Phase I subproject will replace two existing overhead bridge cranes in the F&H Separations Facilities' hot canyons. One new hot crane is being developed, tested, and built on a separate cost-funded project. A duplicate of the developmental crane will be fabricated and both cranes installed under this line item. The existing cranes will also be dismantled and removed. FY 1987 funds will be used to continue procurement, construction, and installation.

d. Foster Wheeler Boiler Retubing, RL (TEC: $6,300,000; FY 1987 BA $850,000)

This Phase I subproject provides for return of the Foster Wheeler boiler to a nuclear steam hot standby mode. Necessary work includes replacement of boiler steam tubes, modification of inner skin supports, and installation of a stack damper. The requested FY 1987 funding will be used to complete construction.

e. Drive Turbine Upgrades, RL (TEC: $2,500,000; FY 1987 BA $1,470,000).

This Phase I subproject will provide for replacement of the existing N Reactor mechanical turbine governors and improvement of the oil supply to the drive turbines. FY 1987 funding will be used for design and procurement.

f. Water Sampling System Upgrades, RL (TEC: $4,600,000; FY 1987 BA $1,000,000)

This Phase I subproject will provide for replacement of N Reactor's non-radioactive sample conditioning system and radioactive and non-radioactive sample analyzer equipment. FY 1987 funding will be used for design and initial procurements.

g. Radioactive Drain System Replacement, RL (TEC: $9,300,000; FY 1987 BA $1,900,000)

This Phase I subproject will provide for replacement of the 12-inch and 36-inch lines between the N Reactor Building Lift Station and the Waste Treatment Pilot Plant Facility. FY 1987 funding will be used to initiate design, procurement, and construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I and II
Various Locations

2. Project No. 86-D-149

8. Brief Physical Description of Project (continued)

h. N Reactor Coolant System Components, RL (TEC: $24,800,000; FY 1987 BA $12,400,000)

This Phase I subproject provides for the rehabilitation of the primary coolant pump ancillary system, refurbishment of the V-11 flow control valves located on the reactor inlet connectors, and upgrading of the flow monitor system. The funds being requested in FY 1987 will be used to begin procurement and installation of the V-11 flow control valves and for design of the flow monitoring system.

i. Feed Materials Production Center Upgrade, OR (TEC: $95,000,000; FY 1987 BA $21,830,000)

This multi-phase subproject provides for the modernization of equipment at the Feed Materials Production Center (FMPC) which is utilized in the processing of depleted uranium and slightly enriched uranium in support of production reactor operations at Savannah River and Richland. The requested FY 1987 funds will be used for design, procurement, and construction. Phase I work includes:

- A new exhaust system for the process reactors.
- A new pressure swing absorption system to supply nitrogen to Plants 4, 5, and 9.
- New equipment and facilities for milling magnesium fluoride which has been used in casting enriched uranium derbies.
- Automation and modification of the refinery and Plant 8 sump systems.
- Acquisition of new pot and derby handling equipment.
- Installation of NO_x scrubbers on the scrap and chip pickling processes.
- Improved materials handling in the uranium reduction area.
- A new furnace to oxidize uranium with enrichments up to 10 percent.
- Combining the Plant 9 zirconium decladding process with the Plant 8 aluminum process.
- Replacement of the Plant 9 furnace and associated loading and burnout stations used to melt and cast uranium.

Phase II tasks will include:

- Equipment to process metal spills.
- Renovation of the depleted slag milling system and improvements to the associated dust collection equipment.
- Replacement of the Titan mill and ancillary equipment used to process magnesium fluoride slag into liner material.
- Upgrading of Plant 2 solvent extraction process.
- A new automated furnace for heat treatment of uranium ingots.
- Improved UF_4 packaging equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II
Various Locations

2. Project No. 86-D-149

8. Brief Physical Description of Project (continued)

- o Digester feed system improvements in Plant 2.
- o Renovation of the crane used to unload hoppers at the rail spur.
- o New feed and off-gas systems for oxidation furnace number 1 in Plant 8.
- o A crusher and dust collection system in Plant 8.
- o A new digestion system for enriched uranium.

j. Canyon Process Control Automation, SR (TEC: $21,000,000; FY 1987 BA $3,030,000)

A new microprocessor-based, distributed control system will be provided for the F-Area Separations Canyon under this Phase II subproject. Batch sequencing operations, calculations, and data archiving will be performed automatically by the new system. Operator interface will be via CRT keyboards allowing information to be displayed in a more useful dynamic format. Some modifications to building space, the ventilation system, and the electrical supply system will be necessary. The funding being sought in FY 1987 will be used for initial design and long lead time procurements.

k. Improved Slug Processing Facilities, SR (TEC: $15,500,000; FY 1987 BA $7,700,000)

This Phase II subproject replaces a portion of the existing uranium-core slug manufacturing line. The components to be replaced include: the lubrication dip and drying station; an argon atmosphere furnace for heating the slug assemblies; the hot die size bonding press, a quench tank, the end bonder, and the shell blast cleaner. The new equipment will be designed and arranged for fully-automatic operation and ease of maintenance. FY 1987 funding will be used for initial design and procurement plus construction preparation.

9. Purpose Justification of Need for, and Scope of Purpose

Increased demands have been placed on the plants and equipment used to produce nuclear materials for weapons fabrications in recent years as the Department of Energy (DOE) attempts to satisfy the Department of Defense force structures specified in the Presidentially approved Nuclear Weapons Stockpile Memorandum. With the additional materials throughput that will occur with the startup of L Reactor; blending of the fuel-grade plutonium produced by the PUREX facility at Richland, Washington, with high-purity plutonium produced at Savannah River; and the introduction of other production initiatives, it will be necessary for this existing equipment to operate at an extremely high level of reliability. The purpose of the Productivity Retention Program is to increase the operating availability (utility factor) or efficiency of critical components or systems in keeping with this demand. It will also bring selected elements of the complex into compliance with technical or safety requirements that have either recently come into effect or that have only become applicable at the higher production rates now required.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II
Various Locations
2. Project No. 86-D-149

9. Purpose Justification of Need for, and Scope of Purpose (continued)

Due to the size of the undertaking required and need to tightly sequence construction with available production windows, work will be requested in phases. Each phase will be constituted as an independent line item. Detailed justification for the major subprojects comprising Phases I and II follows:

a. Replace Thermal Diffusion Columns, SR

The new thermal diffusion column process being installed will provide significant higher capacity and efficiency while also relieving reliability and maintenance problems.

b. JB-Line Productivity Retention

The proposed physical improvements will:

- Increase process reliability and utility to meet production objectives.
- Reduce radiation exposure to personnel to a level which is as low as reasonably achievable within the existing JL-Line facility.
- Improve contamination control to reduce assimilation risk.
- Improve containment of process liquid to reduce product losses and prevent release to the environment.
- Reduce dependence on procedural control for protection against assimilations.
- Improve product quality (reduce impurities).
- Reduce criticality risk.

c. Hot Canyon Cranes, SR

The hot canyon cranes are used to charge irradiated targets into the dissolver and to replace failed separations process components. The cranes operate in a highly radioactive area that personnel can not enter and are a vital link to maintaining separations operations. During the 30 years in which they have been in service the condition of the cranes has deteriorated significantly. This deterioration results from a combination of wear, radiation damage, the corrosive environment in which the cranes operate, and the caustic chemicals that must be used for decontamination prior to maintenance activities. Repair times have increased dramatically in recent years and the cranes are presently out of service one out of every four hours. A good share of this increased down time traces to the inability to remove fixed contamination; a condition that will only worsen with time.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II Various Locations

2. Project No. 86-D-149

9. Purpose Justification of Need for, and Scope of Purpose (continued)

d. Drive Turbine Upgrades, RL

N Reactor drive turbines are in need of extensive repairs to prevent a major outage caused by turbine failure. Governor replacement and oil supply improvements will maintain reactor production capabilities.

e. Water Sampling System, RL

Repair and replacement of the water sampling systems will assure the reactor is operated with water which meets current process standards for critical systems. State-of-the-art sampling equipment will allow quick, accurate analyses and better control.

f. Radioactive Drain System Replacement, RL

Replacement of the 12-inch and 36-inch radioactive drain lines will assure safe handling of radioactive and chemical effluents. New lines will allow ready monitoring of flow and will help prevent line leaks.

g. N Reactor Cooling System Components, RL

Replacement of the degraded N Reactor pump ancillary equipment will eliminate the extended maintenance outages currently necessary to keep the pumps in service. Upgrading of the flow monitor system and V-11 valves will similarly reduce the number of reactor scrams caused by instrumentation and control system. The existing V-11 valves (1003) are nearing the point of failure. The valve discs are heavily pitted near the edges and eroded through at their connection with the shaft. As larger pieces of the disks begin to breakoff they will be carried downstream and are likely to become lodged in a flow monitoring venturi or a fuel tube. Either would cause the reactor to scram. These scrams will result in both lost special nuclear materials production and steam production revenues.

h. Feed Materials Production Center Upgrade, Fernald

Extensive equipment and safety improvements are required at the Feed Materials Production Center (FMPC) to ensure the continued capacity to meet programmatic needs and increasingly stringent radiological and industrial safety requirements. The tasks included in Phases I and II will automate various process steps thereby increasing throughput and reducing operator exposures to both radiation and fumes.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II
Various Locations
2. Project No. 86-D-149

9. Purpose Justification of Need for, and Scope of Purpose (continued)

i. Canyon Process Control Automation, SR

The F canyon is currently controlled via a manual process requiring approximately 900 written procedures. All data recordings, calculations, and material transfers must be performed by the operating staff. This approach is slow, manpower intensive, and subject to error. Approximately $3,400,000 a year can be saved by the installation of distributed control system (DCS) that would automate many of these operating steps. With such a system, tasks such as hot feed stabilization that now take 30 minutes to perform, could be completed in three minutes. The DCS will also allow the near-real time accountability readings required for improved safeguards.

j. Improved Slug Processing Facilities, SR

The present equipment has pressed two million slugs in its 16-year lifetime. Under current production forecasts, an additional two million slugs will have to be pressed over the next six years. The new equipment being installed by this subproject, will be designed for a higher throughput rate (3 slugs per minute) consistent with planned reactor operating schedules.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II Various Locations

2. Project No. 86-D-149

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10. Details of Cost Estimate[a]

Item	Item Cost	Total Cost
A. Engineering Design & Inspection at approximately 22% of Construction Costs, Item B		$ 40,615
B. Construction Costs		174,904
1) Buildings	$ 5,235	
2) Special Facilities	162,359	
3) Utilities	7,310	
C. Removals and Maintaining Production Costs		10,814
Subtotal (Items A, B, and C)		226,333
D. Contingencies at approximately 22% of above costs		48,477
E. Design & Construction Liaison, Testing Checkout, and Acceptance		7,290
Total Project Cost		$282,100[b]

11. Method of Performance

Method of performance will vary with location. At Savannah River design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible. At Fernald design and inspection will be performed with a negotiated architect-engineer contract. Construction and procurement will be accomplished by both cost-reimbursement and firm fixed-price contracts. At Richland design and inspection services will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed price contracts and subcontracts awarded on the basis of competitive bidding. Subproject g. will be pursued as a design-construct contract.

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[a] Based on varying degrees of conceptual design completion.

[b] Excludes $4,300,000 nonfunded equipment transfer for developmental hot canyon crane and prototype N Reactor drive turbine control system.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phases I & II
Various Locations

2. Project No. 86-D-149

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	Total
A. Total Project Funding										
1) Total Facility Costs										
a. Construction Line Item ..$	0	$ 14,360	$ 61,080	$ 90,100	$ 61,350	$32,780	$11,750	$ 7,380	$ 3,300	$282,100
b. Plant Engineering and Design (PE&D)	0	0	0	0	0	0	0	0	0	0
c. Expenses Funded Equipment	4,300	0	0	0	0	0	0	0	0	4,300
d. Inventories	0	0	0	0	0	0	0	0	0	0
Total Inventory Costs	$ 4,300	$ 14,360	$ 61,080	$ 90,100	$ 61,350	$32,780	$11,750	$ 7,380	$ 3,300	$286,400
2) Other Project Funding										
a. R&D Necessary to Complete Construction ..	3,230	800	860	470	270	180	0	0	0	5,810
b. Conceptual Design	3,388	310	0	0	0	0	0	0	0	3,698
c. Engr. Studies	1,785	1,485	175	265	180	150	95	0	0	4,135
d. Other Project Related Costs	2,640	1,365	1,275	760	810	470	460	0	0	7,780
Total Other Project Funding	11,043	3,960	2,310	1,495	1,260	800	555	0	0	21,423
Total Project Funding	$15,343	$18,320	$63,390	$ 91,595	$62,610	$33,580	$12,305	$7,380	$3,300	$307,823

B. Total Related Funding Requirements (Estimated Life of Project - 20 to 40 years)

1) Facility Operating Costs	$(5,800)
2) Programmatic Operating Expenses Directly Related to the Facility	0
3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	50
4) GPP or Other Construction Related to the Programmatic Effort in the Facility	50
5) Other Costs	400
Total Other Related Annual Funding Requirements	$(5,300)

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Productivity retention program, Phase I
Various Locations

2. Project No. 86-D-149

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project funding

1) Total facility
   a. Construction Line Item - No narrative required.
   b. PE&D - None
   c. Expense Funded Equipment - Developmental SR hot canyon crane and prototype N Reactor drive turbine control system.
   d. Inventories - None

2) Other project funding
   a. R&D necessary to complete construction - Includes $4,560,000 for the two "JB-Line Productivity Retention" subprojects; $1,050,000 for the two FMPC Upgrades; and $200,000 for the "Improved Slug Processing Facilities" subproject.
   b. Conceptual Design - No narrative required.
   c. Engineering Studies - Includes studies for "JB-Line Productivity Retention," "Hot Canyon Cranes," "Thermal Diffusion Columns," "Canyon Process Control Automation,"and "Improved Slug Processing" subprojects.
   d. Other project related costs - Includes $3,300,000 for cost funded upgrading of instrumentation that provides input signals to computers being installed under for "Canyon Process Control Automation" subproject and $4,480,000 for management of Richland subprojects.

B. Total Related Funding Requirements

Annual operating cost will be significantly reduced as a result of improved system reliability and higher efficiencies. The figures shown do not include the dollar value of the increased nuclear materials output that will be achieved.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

(Tabular Dollars in Thousands; Narrative Material in Whole Dollars)

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1. Title and Location of Project: In-core neutron monitoring system, N reactor, Richland, Washington

2. Project No. 86-D-150

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3. Date A/E work initiated: 2nd Qtr FY 1985 (PE&D)

3a. Date physical construction starts: 2nd Qtr FY 1986

4. Date construction ends: 2nd Qtr FY 1988 a/

5. Previous cost estimate: $7,550
Date: 3/84

6. Current cost estimate: $8,000
Less amount for PE&D: $ 450
Net cost estimate: $7,550
Date: 1/86

Financial Schedule

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1986	$ 5,460	$ 5,460	$ 5,460	$ 4,100
1986 Sequestered	0	(330)	(330)	(250)
1987	$ 2,760	2,090	2,090	$ 3,250
1988	330	330	330	450

8. Brief Physical Description of Project

The proposed in-core neutron monitoring system project will provide a system to measure neutron flux levels at selected points in the reactor. The proposed system will replace an inoperative system that was installed in the reactor 20 years ago. That early system was rendered inoperative by detector burnout after 2 years of operation, leaving the only flux monitoring capability in the traveling wire flux mapping (TWFM) system. The TWFM system obtains a flux profile constructed from data obtained in nine different channels available in the reactor core.

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a/ Two quarter schedule delay resulting from Gram-Rudman-Hollings funding reduction.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: In-core neutron monitoring system, N reactor, Richland, Washington

2. Project No. 86-D-150

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8. Brief Physical Description of Project (Continued)

The proposed state-of-the-art system will provide automatic, real-time, three-dimensional power displays. As presently anticipated, a total of approximately 250 fixed detectors and one movable detector will be installed in the horizontal graphite cooling tubes. Less than 100 separate cooling tubes will be needed for the reactor graphite moderator.

The fixed detectors will be installed in the graphite cooling tubes to monitor neutron flux during reactor operation up to and including full power.

The movable detector will scan the neutron flux level during reactor shutdown and startup, but will be withdrawn during normal reactor operation. The movable detector will be inserted and withdrawn by a drive and transfer mechanism which will allow access to any one of approximately 20 guide tubes (drywells) in the Graphite and Shield Cooling System allowing the movable neutron flux probe to traverse the reactor core from side to side. The drive and transfer mechanism can be programmed or manually operated to allow automatic traverse of the reactor core or operator site selection. The drive and transfer mechanism will be operated from the reactor control room under normal conditions, but alternate controls will be provided at the drive mechanism location to facilitate maintenance and to assure system control. Personnel shielding will be provided to minimize personnel exposure from the stowed movable detector.

The outputs of the fixed detectors and the movable detector will receive electronic signal amplification, then they will be multiplexed into an existing computer. Continuous digital and graphic readouts will be provided. The system will detect a range of reactor flux from approximately 5×10^{10} to 5×10^{13} neutrons/cm^2-second, with system response to changes of flux of less than one second and system accuracy within ± 15%, with a 97% confidence level at the selected range.

System components will be placed in various locations in the reactor building.

Project activities will include definitive design, procurement, construction, and field engineering. Funds requested in FY 1987 will be used to continue construction.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: In-core neutron monitoring system, N reactor, Richland, Washington

2. Project No. 86-D-150

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9. Purpose, Justification of Need for, and Scope of Project

The installation of a state-of-the-art in-core neutron monitoring system will enhance operating surveillance capabilities, increase reactor productivity, and improve margins of safety for the reactor. At present, the only in-core flux-monitoring capability for the reactor is the traveling wire flux mapping (TWFM) system which obtains a flux profile from date obtained in nine different channels available in the reactor core. The TWFM uses flexible metal wires inserted into the reactor core that become activated by the neutron flux. When the wires are withdrawn, the radioactive isotopes must decay for 2 days before the wires can be reinserted. The TWFM system is outdated, costly to maintain, and shows signs of deterioration. The TWFM can be inserted and withdrawn only two or three times during an operating period, and any information derived can be evaluated only through time-consuming effort.

The proposed in-core system will provide automatic, real-time, three-dimensional power displays which will assist operators in detecting localized power peaking, will provide monitoring of global power changes, and will supply data for fuel management. Surveillance will be continuous, and the data will help maximize yield through maintenance of specific process tube power levels.

The industry which produces state-of-the-art in-core detectors like those proposed for use in this project has advanced considerably since in-core detectors were originally installed in this plant. New detector designs, materials, and data processing interfaces have increased equipment reliability and made information gathered by the detectors invaluable for reactor operation. Use of such in-core detectors will assure data can be used to increase production in keeping with the mission given this reactor.

Safe operation of the reactor will be enhanced by an increased number of detector locations allowing detection of potential xenon and power oscillations.

An economic analysis of installation of the in-core neutron monitoring system and do-nothing alternative revealed several benefits to be gained by installation of the proposed in-core system. The in-core system will cost $8,000,000 to install, but operating improvements to be gained will be equivalent to seven full power days of production outages per year valued at a total of $9,100,000 per year. Such improved operation will be possible because of the following benefits to be

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1. Title and Location of Project: In-core neutron monitoring system, N reactor, Richland, Washington

2. Project No. 86-D-150

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9. Purpose, Justification of Need for, and Scope of Project (Continued)

realized by the proposed in-core system. Assuming 20 scheduled and unscheduled outages per year, accelerated startup rates of 10 megawatts per minute would add four full power days. Verification that a newly charged tube with a failed temperature sensor is not mischarged will be possible (adding two full power days). More consistent achievement of a 4000-megawatt power level and operation at that power level for a year will also be possible (adding one full power day). Improvement of definitions of safety margins associated with local overpower protection and tube power limits should also be realized.

Other benefits will be gained by installation of the proposed in-core system. Among these is achievement of full core flux flattening through use of a fuel charge with fuel elements having different enrichments (such fuel is now available). Such a fuel charge will allow flux flattening in the axial direction and will give rise to improved conversion ratios. Flexibility of reactor operation is increased permitting either increased reactor production at a given plutonium-240 percentage, producing the same amount of material with a lower plutonium-240 percentage, or producing the same amount of 6 percent plutonium-240 in fewer operating days (permits longer maintenance outages.) Flattening the flux, thus the rate of local fluence accumulations, will support extending the life of the reactor by approximately 30 full power days per calendar year, which consists of about 185 full power days. Flux flattening will also provide more uniform product quality permitting longer operation between refuelings for a given plutonium-240 percentage. With a flattened core, certain operating margins can be redefined thus eliminating the imposition of certain very conservative operating constraints.

Added benefits in core surveillance and accident prevention will also be gained by installation of the proposed in-core system. Among these benefits are a means of measurement of core component movement, observation of rapid localized reactivity perturbation through use of special processing, and monitoring of dispersion of ball safety system materials in the reactor core.

If FY 1987 funds are not made available, installation will be delayed 1 year with an accompanying increase in project costs. A delay in funding would also mean continued use of the TWFM system with consequent increases in TWFM maintenance costs, delays in data evaluation and further losses of opportunities for increased production and revenues.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: In-core neutron monitoring system, N reactor, Richland, Washington

2. Project No. 86-D-150

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10. Details of Cost Estimate [a]

	Item Cost	Total Cost
A. Engineering, design and inspection at 3% of construction costs, item B		$ 180
B. Construction costs..		6,040
(1) Special facilities (includes the fixed and movable detectors and the transport mechanism)..		
o Procured items..	$4,420	
o Installation..	$1,620	
C. Standard equipment..		0
D. Removal less salvage..		0
Subtotal................		$ 6,220
E. Contingency at approximately 21% of the above costs..........................		$ 1,330
Total estimated costs...		$ 7,550

This cost estimate is based upon a conceptual estimate made by the on-site Architect-Engineer; a final estimate will be incorporated in the conceptual design Report, and any changes made will be incorporated into a revision of this Construction Project Data Sheets.

11. Methods of Performance

The project design and inspection services will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed price contracts and subcontracts awarded on the basis of competitive bidding.

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[a] Does not include $450,000 in FY 1985 PE&D funds.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: In-core neutron monitoring system, N reactor, Richland, Washington

2. Project No. 86-D-150

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12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior years	FY 1986	FY 1987	FY 1988	Total
a. Total project costs					
1. Total facility costs					
(a) Construction line item	$ 0	$3,850	$3,250	$ 450	$7,550
(b) PE&D	410	40	0	0	450
(c) Inventories	0	0	0	0	0
Total direct costs	$ 410	$3,890	$3,250	450	$8,000
2. Other project costs					
(a) R&D necessary to complete construction	$ 0	$ 0	$ 0	$ 0	$ 0
(b) Conceptual design costs	150	0	0	0	150
(c) Other project related costs	50	50	130	0	230
Total other project costs	$ 200	$ 50	$ 130	$ 0	380
Total project costs (Item 1 & 2)	$ 610	$3,940	$3,380	$ 450	$8,380

b. Other related annual costs (estimated life of project: 20 years)

1. Facility operating costs	$ 150
2. Programmatic operating expenses directly related the facility	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility	200
4. Maintenance, repairs, GPP, or other construction related to programmatic effort for the facility	0
Total related annual costs	$ 350

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: In-core neutron monitoring system, N reactor, Richland, Washington

2. Project No. 86-D-150

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding
  1. Total facility
    (a) Construction Line Item - These are funds to be used for construction.
    (b) PE&D - FY 1985 PE&D will provide for architect-engineer services to accomplish design (including software) and to prepare equipment specifications.
    (c) Other project related funding - Included are the costs of project management, project support, project start-up, and training.

b. Total related funding requirements - It is estimated that the in-core neutron monitoring system will be used for seven to 20 years for its programmatic purposes.

  1. Facility operating costs - These costs include the annual costs for operating and maintaining monitoring equipment and for purchase of spare parts.

  2. Programmatic operating expenses directly related to the facility - none.

  3. Capital equipment not related to construction but related to the programmatic effort in the facility - These funds will be used in FY 1987 for control room simulator modifications.

  4. Maintenance, repair, or other construction related to programmatic effort - none.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative materials in whole dollars.)

1. Title and Location of Project: PUREX electrical system upgrade, Richland, Washington

2. Project No. 86-D-151

3. Date A-E work initiated: 2nd Quarter FY 1985

3a. Date physical construction starts: 2nd Quarter FY 1986

4. Date construction ends: 4th Quarter FY 1988

5. Previous cost estimate: $ 8,300
Date: 2/84

6. Current cost estimate: $ 9,500
Less amount for PE&D: $ 1,200
Net Cost estimate: $ 8,300
Date: 12/85

7. Financial Schedule

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1986	2,500	2,500	2,500	1,500
1986 Sequestered	0	(120)	(120)	(75)
1987	3,780	3,900	3,900	4,500
1988	2,020	2,020	2,020	2,375

8. Brief Physical Description of Project

This project will upgrade three electrical systems within the PUREX Plant that have been determined to be incapable of supporting long-term plant operation and process expansion. In their present condition, the electrical systems are hazardous to personnel and require excessive maintenance. The three systems are process wiring, motor control centers, and lighting.

Much of the original process wiring throughout the PUREX Pipe and Operating (P&O) Gallery will be replaced. Cable runs will be separated by electrical function to reduce the induced noise in the instrument systems and nearby power and high voltage wiring will be shielded to eliminate induced voltage and false signals on essential monitoring and control circuits. Wiring for the area radiation monitors, emergency power circuits, and normal power circuits will be replaced with wiring that complies with current applicable codes and standards.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: PUREX electrical system upgrade, Richland, Washington

2. Project No. 86-D-151

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8. Brief Physical Description of Project (Cont'd)

The existing Motor Control Centers will be replaced to insure that the systems meet current electrical safety codes. The new Motor Control Centers and new feeder cables will be compatible with the existing low voltage (480 Volt) distribution system of the PUREX Plant. Branch circuit protection devices will be circuit breakers unless the load serviced requires a fused device to meet UL requirements. All motor starters will have motor circuit protectors providing overcurrent protection on all phases.

Much of the incandescent lighting throughout the PUREX Plant will be replaced with more efficient, longer life lighting fixtures. Lighting in the PUREX Canyon will be replaced by high intensity discharge fixtures using remote ballasts. Fluorescent light fixtures with exposed tubes and fixtures without tube locking devices also will be replaced. Lighting systems will be upgraded in those areas where the illumination levels are substandard for the work being performed.

9. Purpose, Justification of Need, and Scope of Project

The purpose of this project is to improve the reliability of PUREX Plant operations, provide for future plant processes, reduce maintenance and remove safety hazards to personnel.

Most of the electrical equipment and wiring to be improved or replaced has been in place since the PUREX Plant was completed in 1956 and is not suitable for longer-term plant operation, being in deteriorated condition. The Motor Control Centers are obsolete, so that replacement parts are not readily available and can be obtained only at premium cost. Some equipment has been installed in enclosures that do not provide the desired protection from the working environment. Much of the maintenance work on this equipment must be performed with the equipment energized, creating difficult working conditions, with the only alternative being to shut down parts of the plant during that maintenance.

The process wiring now in use is susceptible to failure since it is installed in crowded wireways with some wiring operating at higher voltage and current than the original design. This leads to overheating, cracking and failure of the insulation. Shorting due to the loss of insulation would cause a failure of many additional wires near the point of failure and require an extensive plant repair outage and possible losses in production. Power cables and instrumentation wiring in the same wireways produce induced noise and false signals in the instrument readings. Further, it is extremely difficult and time consuming to make wire replacements.

1. Title and Location of Project: PUREX electrical system upgrade,
Richland, Washington

2. Project No. 86-D-151

9. Purpose, Justification of Need, and Scope of Project (Cont'd)

A change from obsolete incandescent lighting to long-life types is especially desirable in those areas of the plant that are relatively inaccessible due to high radiation levels or airborne contamination. The existing lighting requires extensive maintenance that increases the radiation exposure to maintenance personnel. In addition to these conditions, many areas of the plant have substandard illumination levels for the work being performed.

PUREX Plant resumed operations in Fiscal Year 1984. Interruptions in plant operation can be expected due to electrical equipment failures if the equipment is not upgraded. Maintenance costs will be high both for labor and for replacement of parts for obsolete equipment. Work required in radiation zones will increase personnel radiation exposures, and maintenance under difficult working conditions will not be corrected. The continuity of plant operations and long-range production plans will be impacted.

Delays in competing the project will require operating the plant under these undesirable and gradually worsening conditions. A major failure in the electrical systems could require a plant shutdown of from one to twelve months for repairs while plant operating expenses of approximately $1,000,000 per week continue to be incurred, and would have an impact of production loss/delay of approximately 5 metric tons uranium per day. The FY 1987 funding will be used to continue procurement and construction.

10. Details of Cost Estimate

	Total Cost
a. Engineering design and inspection at 27% of construction costs	$ 1,650 [a]
b. Construction costs	6,100
Subtotal	$ 7,750
c. Contingency at approximately 23% of above cost	1,750
Total project cost	$ 9,500

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[a] Includes $1,200,000 in FY 1985 PE&D funds.

1. Title and Location of Project: PUREX electrical system upgrade,
Richland, Washington

2. Project No. 86-D-151

11. Method of Performance

Definitive design and field engineering will be performed by the Hanford on-site Architect-Engineer contractor. Construction will be performed by the Hanford on-site construction services contractor on a Cost Plus Award Fee basis. Equipment procurement will be on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
A. Total project costs						
1. Total facility costs						
a. Construction line item	$ 0	$ 0	$1,425	$4,500	$2,375	$ 8,300
b. PE&D	0	540	660	0	0	1,200
c. Expense-funded equipment and inventories.	0	0	0	0	0	0
Total facility costs	$ 0	$ 540	$1,425	$4,500	$2,375	$ 9,500
2. Other project costs						
a. R&D to complete construction	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
b. Conceptual design costs	250	0	0	0	0	250
c. Other project related costs	0	50	100	75	75	300
Total other project funding	$ 250	$ 50	$ 100	$ 75	$ 75	$ 550
Total project costs	$ 250	$ 590	$1,525	$4,575	$2,450	$10,050

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: PUREX electrical system upgrade,
Richland, Washington

2. Project No. 86-D-151

12. Funding Schedule of Project Funding and Other Related Funding Requirements (Cont'd)

B. Other related annual costs

	Annual Costs
1. Facility maintenance and operating cost	$ 0
2. Programmatic operating expenses	0
3. Capital equipment not related to construction	0
4. GPP or other construction related to project	0
Total related annual cost requirement	$ 0

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project funding
  1. Total facility costs
     a. Construction line item total cost estimate is $9,500,000. Construction is scheduled from the second quarter of FY 1986 through the fourth quarter of calendar year 1988.
     b. Plant engineering and design funding provided for the early start of definitive design.
     c. Expense funded equipment and inventory funding are not requested.

  2. Other project funding
     a. Research and development - None
     b. A conceptual design has been completed at a cost of $250,000.
     c. Other project related costs include project management and functional support by Rockwell Hanford Operations.

B. Other related funding requirements
  1. Facility maintenance and operating costs for the electrical equipment to be improved by this project are included in the operating cost of the PUREX Plant, estimated to be $60,000,000 annually.
  2. No programmatic operating expenses are requested.
  3. No capital equipment not related to construction funding is requested.
  4. No GPP or other construction funding is requested.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Reactor electrical distribution system
Savannah River, South Carolina

2. Project No.: 86-D-152

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3. Date A-E work initiated: 2nd Qtr. FY 1986

3a. Date physical construction starts: 1st Qtr. FY 1987

4. Date construction ends: 2nd Qtr. FY 1989 b/

5. Previous cost estimate: $22,550
Date: 3/84

6. Current cost estimate: $21,000 a/
Less PE&D: 0
Net cost estimate: $21,000
Date: 1/86

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7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 2,000	$ 3,000	$ 3,000	$ 1,390
1986 Sequestered	0	(290)	(290)	(130)
1987	8,410	7,700	7,700	6,610
1988	7,090	7,090	7,090	8,410
1989	3,500	3,500	3,500	4,720

8. Brief Physical Description of Project

This project provides for the following improvements to the electrical systems of the four nuclear materials production reactors at Savannah River:

o Replacement of rotating electrical generating equipment with a 150 kva uninterruptible power supply (UPS) system for electrical loads essential to reactor safety. The UPS system will supply power to emergency systems via two separate and redundant cable systems, in accordance with current separation criteria.

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a/ Cost revised to reflect lower escalation forcast and funding availability.
b/ One quarter delay incurred as a result of funding stretchout.

1. Title and Location of Project: Reactor electrical distribution system
Savannah River, South Carolina
2. Project No.: 86-D-152

8. Brief Physical Description of Project (Cont'd)

- Upgrading the monitoring and control circuits for automatic transfer switches (ATS) that transfer power source for critical equipment to an alternate supply should normal supply become unavailable. The monitoring circuit revision will include adding indications of switch position in the reactor control room to supplement the existing field indication and adding an alarm in the control room to indicate whenever any of the seven critical ATS's fails to transfer properly.

- Redistributing critical electrical loads among the sources of emergency electrical supply and removing non-critical loads from the emergency supply.

The FY 1987 funds will be used to continue design and procurement and to initiate construction.

9. Purpose, Justification of Need for, and Scope of Project

A comprehensive safety analysis study of the SRP reactor electrical distribution system (REDS) has confirmed the reliability of REDS but identified several areas that should be upgraded to meet current industry practices and advancing technology.

Presently the emergency bus of the Electrical Distribution System (EDS) supplies approximately 1750kw of non-emergency load. This equipment is designed to automatically shutdown during loss of normal power and procedural controls prevent restart. This is contrary to current industry practice. Overload of emergency generators could occur if the equipment remained connected to the emergency bus during an emergency due to failure of the equipment to load shed or due to personnel error.

Automatic transfer switches (ATS) are used throughout REDS to switch electrical power between alternate feeds to critical equipment. Currently Central Control Room (CCR) instrumentation does not provide indications of ATS position. This data must be obtained by deploying personnel to the ATS field location. Also some of the ATS's require manual reset, at the ATS, to return to the normal power position. Response to accident situations can be enhanced if the status and control of the ATS's is readily available to the CCR operator. One of these ATS in each reactor switches between alternate DC sources for operation of critical emergency bus tie-breakers. Solid state devices are now available which can replace the ATS and increase system reliability.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and Location of Project: Reactor electrical distribution system
Savannah River, South Carolina

2. Project No.: 86-D-152

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9. Purpose, Justification of Need for, and Scope of Project (Cont'd.)

Power to reactor building building instrumentation is maintained during the time between normal power failure and starting of main emergency generators by continuously operating battery powered motor generator sets. This rotating equipment and associated controls have been in service since plant startup. Adequate spare parts are no longer available and the system is increasingly difficult to maintain. Solid state uninterruptible power supply (UPS's) are now available to replace these units and afford improved system operating characteristics. In addition, the system can be reconfigured to meet current SRP guidelines for physical separations criteria.

10. Details of Cost Estimate [c/]

		Item cost	Total cost
A. Engineering design at approximately 28% of construction costs, Item B			$ 3,267
B. Construction costs,			11,815
1) Building Modifications		73	
2) Major Equipment		3,167	
a. Uninterruptible power supplies	1,872		
b. Switches and breakers	919		
c. Starters and motor control centers	376		
3) Electrical		8,136	
4) Mechanical		439	
C. Removal costs			1,784
Subtotal (Items A, B, and C)			$16,866
D. Contingencies at approximately 19% of above costs			3,172
E. Design and construction liaison, testing, checkout and acceptance			962
Total estimated cost			$21,000

11. Method of Performance

Design and construction will be performed by the operating contractor. Procurement will be accomplished by the contractor. Procurement will be accomplished by the operating contractor utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

[c/] This estimate is based on complete conceptual design.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Reactor electrical distribution system
Savannah River, South Carolina

2. Project No.: 86-D-152

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12. Funding Schedule of Project Funding and Other Related Requirements

	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	Total
A. Total project costs						
1) Total facility costs						
a) Construction line item	$ 0	$ 1,260	$ 6,610	$ 8,410	$ 4,720	$21,000
b) PE&D	0	0	0	0	0	0
c) Expense funded equipment	0	0	0	0	0	0
d) Inventories	0	0	0	0	0	0
Total facility costs	$ 0	$ 1,260	$ 6,610	$ 8,410	$ 4,720	$21,000
2) Other project costs						
a) R&D necessary to complete construction	$ 310	$ 75	$ 0	$ 0	$ 0	$ 385
b) Other project related costs	0	0	0	0	0	0
Total other project costs	$ 310	$ 75	$ 0	$ 0	$ 0	$ 0
Total project costs (Items 1 and 2)	$ 310	$ 1,335	$ 6,610	$ 8,410	$ 4,720	$21,385

B. Other related annual costs (Estimated life of project: 40 years)

1) Facility operating costs..	$ 0
2) Programmatic operating expenses directly related to the facility...........	0
3) Capital equipment not related to construction but related to the programmatic effort in the facility..	0
4) GPP or other construction related to the programmatic effort in the facility	0
Total other related annual costs..	$ 0

13. Narrative explanation of total project funding and other related funding requirements:

A. Total project costs
   1) Total facility costs
      a) Construction line item - Narrative not required
      b) PE&D - None
      c) Expense funded equipment - None
      d) Inventories - No inventories are needed for the proposed facilities

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1. Title and Location of Project: Reactor electrical distribution system
Savannah River, South Carolina

2. Project No.: 86-D-152

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13. Narrative explanation of total project funding and other related funding requirements: (Cont'd)
    2) Other project costs
        a) R&D - Includes conceptual design costs of $110,000 and engineering studies costs of $275,000
        b) Other project related costs - None

    B. Other related annual costs:
        1) Facility operating costs - None
        2) Programmatic operating expenses directly related to the facility - None
        3) Capital equipment not related to construction but related to the programmatic effort in the facility - None
        4) GPP or other construction related to programmatic effort in the facility - None
        5) Other costs - None

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and Location of Project: Additional line III furnace
Savannah River, South Carolina

2. Project No.: 86-D-153

3. Date A-E work initiated: 1st Qtr. FY 1986

3a. Date physical construction starts: 3rd Qtr. FY 1987

4. Date construction ends: 3rd Qtr. FY 1989 a/

5. Previous cost estimate: $16,000

6. Current cost estimate: $16,000
Date: 9/85

7. Financial Schedule:

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	1,500	2,000	2,000	1,250
1986 Sequestered	0	(195)	(195)	(100)
1987	7,605	7,300	7,300	4,850
1988	6,895	6,895	6,895	7,900
1989	0	0	0	2,100

8. Brief Physical Description of Project

This project provides for the design, procurement and installation of an additional electrically heated vacuum furnace to extract tritium from irradiated target elements. The new furnace will be installed in an existing building adjacent to similar units. The building's process piping and tankage are adequate to handle the additional furnace's output; however, the electrical supply system must be enlarged.

A new tritium confinement system will also be installed as part of this project. The system will serve both the new and existing furnaces and will reduce tritium losses during changing by approximately 90 percent. The confinement equipment will be housed in a new 3240 square foot building addition designed to comply with the Department's "resistant structure" criteria.

FY 1987 funding will be used to continue design and procurement and start construction.

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a/ Delayed 6 months as a result of funding stretchout.

1. Title and Location of Project: Additional line III furnace
Savannah River, South Carolina

2. Project No: 86-D-153

9. Purpose, Justification for, and Scope of Project

The purpose of this project is to provide additional production equipment. Tritium extracted from irradiated reactor targets (virgin tritium) supplements recycled tritium which is returned to Savannah River from the military. The tritium confinement system included with the new extraction furnace is required to mitigate the postulated unacceptable operating losses of tritium to the atmosphere which will result from virgin tritium production.

10. Details of Cost Estimate a/

		Item Cost	Total Cost
A. Engineering design and inspection at 23% of construction costs			$ 2,400
B. Construction Costs			10,315
1) Buildings		930	
2) Special facilities		9,385	
a) Piping	1,241		
b) Electrical	1,113		
c) Instrumentation	938		
d) Equipment	6,093		
C. Removal costs			80
Subtotal (Items A, B, and C)			12,795
D. Contingencies at approximately 18% of above costs			2,305
E. Design and construction liaison, testing, checkout, and acceptance			900
Total estimated cost			$16,000

11. Method of Performance:

The operating contractor will perform design and engineering. The operating contractor will accomplish construction and procurement, utilizing fixed price subcontracts awarded on the basis of competitive bidding to the extent feasible.

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a/ Estimate based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Additional line III furnace
Savannah River, South Carolina

2. Project No.: 86-D-153

12. Funding Schedule of Project Funding and Other Related Requirements:

A. Total project costs	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	Total
1) Total facility costs						
(a) Construction line item	$ 0	$ 1,150	$ 4,850	$ 7,900	$ 2,100	$16,000
(b) PE&D	0	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	100	50	0	150
Total facility costs	$ 0	$ 1,150	$ 4,950	$ 7,950	$ 2,100	$16,150
2) Other project costs						
(a) Conceptual design	$ 120	$ 0	$ 0	$ 0	$ 0	$ 120
(b) Other project related costs	0	$ 100	$ 100	$ 50	$ 0	$ 250
Total other project costs	$ 120	$ 100	$ 100	$ 50	$ 0	$ 370
Total project costs (Items 1 and 2)	$ 120	$ 1,250	$ 5,050	$ 8,000	$ 2,100	$16,520

B. Other related annual costs (estimated life of project: 20 years)

1) Facility operating costs	$ 150
2) Programmatic operating expenses directly related to the facility............	0
3) Capital equipment not related to construction but related to the programmatic effort in the facility	50
4) GPP or other construction related to the programmatic effort in the facility	0
5) Other costs	50
Total related annual costs	$ 250

13. Narrative of Total Project Funding and Other Related Funding Requirements

A. Total project costs
1) Total facility costs
a) Construction line item - no narrative required
b) PE&D - none
c) Expense funded equipment - none
d) Inventories - repair parts for process valves, programmable controllers, catalyst, and furnace crucibles
2) Other project costs
a) Conceptual design - includes funds to prepare cost estimates
b) Other project related costs - includes R&D, engineering studies, alternative studies, start-up, procedure development, and initial facility certification.

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1. Title and Location of Project: Additional line III furnace
Savannah River, South Carolina

2. Project No.: 86-D-153

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13. Narrative of Total Project Funding and Other Related Funding Requirements (Cont'd)

B. Other related annual costs
   1) Facility operating costs - includes costs of labor, material, and utilities for a seven-day week, four-shift schedule
   2) Programmatic operating expenses directly related to the facility - none
   3) Capital equipment not related to construction but related to the programmatic effort in the facility - estimated cost to replace capital equipment in associated support systems
   4) GPP or other construction related to programmatic effort in the facility - cost to update or improve items
   5) Other costs - operator training, facility certification and inspection, and other assigned miscellaneous costs.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Effluent treatment facility
Savannah River, South Carolina

2. Project No. 86-D-154

3. Date A-E work initiated: 1st Quarter FY 1986

3a. Date physical construction starts: 4th Quarter FY 1986

4. Date construction ends: 2nd Quarter FY 1989 a/

5. Previous cost estimate: $55,000
Date: 4/84

6. Currently cost estimate: $50,000
Less amount for PE&D: 0
Net cost estimate: $50,000 b/
Date: 12/85

7. Financial Schedule

	Fiscal Year	AUTHORIZATION	APPROPRIATIONS	OBLIGATIONS	COSTS
	1986	$ 2,500	$ 2,500	$ 2,500	$ 2,500
Proposed	1986 Reprogramming c/	$ 6,100	6,100	6,100	3,900
	1987	15,650	15,650	15,650	12,500
	1988	15,150	15,150	15,150	19,250
	1989	10,600	10,600	10,600	11,850

8. Brief Physical Description of Project

This project provides for the design, procurement, and construction of a new wastewater storage and treatment facility to process routine wastewater and spills for the F and H Areas. The project will include:

o A 235 gallon per minute capacity treatment process, with limited redundant backup capacity, comprised of: multimedia filtration (submicro filtration, iron removal, and activated carbon); reverse osmosis; ion exchange; and evaporation.

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a/ Construction necessary to support facility operation will be complete November 1988.
b/ Reflects reduced escalation forecasts and schedule acceleration resulting from proposed reprogramming.
c/ Required to meet Resource Conversation and Recovery Act mandated schedule (November 1988) for termination of discharges to F&H seepage basins.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Effluent treatment facility
Savannah River, South Carolina
2. Project No. 86-D-154

8. Brief Physical Description of Projects - (Continued)

- A 28,400 sq. ft. building to house the processing equipment, house a control room, change facilities, and associated offices.
- Two smaller motor control centers measuring approximately 800 sq. ft. each.
- Two storage basins of 2.0 million gallons capacity each and two above ground waste water storage tanks of 450,000 gallons capacity each.
- Transfer lines connecting the basins and tanks (located in two different operating areas), the treatment plant and the H Area waste tank farm.
- Two process waste water lift stations with 50,000 gallon stainless steel tanks in underground concrete containment sumps.
- Associated roadways and parking facilities.

Since the facility will handle radioactive and nonradioactive hazardous waste, the project will provide shielding of process equipment; leak detection systems for the storage basins and jacketed transfer lines; and filtered exhaust systems for the enclosed regulated areas and some process vessels.

9. Purpose, Justification of Need for, and Scope of Project

Process wastewaters from separations and waste management operations in the F and H Areas contain small quantities of radionuclides plus nonradioactive hazardous elements such as mercury and chronmium. Under past regulations it was possible to discharge these waters and their associated contaminants to earthen seepage basins. This means of disposal is now banned under the "Hazardous and Solid Waste Amendments of 1984" and must be discontinued by November 1988. Project 86-D-154 provides the facilities necessary to remove the pollutants from future wastewaters and terminate the use of the seepage basins.

The project also provides for the treatment of potentially contaminated separations canyon cooling water and storm water runoff from the waste tank farm. Both of these effluent streams have to date been drained to the seepage basins. Due to the large variations in rate of flow of these streams, it is economically necessary to provide temporary storage capacity for surges. Two new 2,000,000 gallon double lined basins will be constructed for contaminated cooling water and two existing basins will be used for storm waters.

The treatment plant will be sized for a maximum throughput of 235 gallons per minute. One hundred and sixty five gallons per minute of this throughput will be for process waste waters. The remaining two gallons per minute will be for the cooling water diversions and storm water being held in the basins.

It is necessary from both an environmental and legal standpoint that the project be completed in a expeditious manner. Hazardous contaminants have already been detected in down gradient ground water monitoring wells near the basins. The continued use of the basins could result in further migration of this material and its eventual entry into the water table. Further, failure to achieve the "Hazardous and Solid Waste Amendments of 1986" mandated schedule for closure of the basins would be a clear violation of Federal law.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Effluent treatment facility
Savannah River, South Carolina

2. Project No. 86-D-154

9. Purpose, Justification of Need for, and Scope of Project: (Continued)

The funding profile shown is the minimum necessary to achieve the November 1988 deadline for closure of the basins. Fiscal year 1987 funds will be used for completion of design and procurement, and to initiate construction.

10. Details of Cost Estimate d/

		Item Cost	Total Cost
A. Engineering design at approximately 11% of Item B			$ 4,500
B. Construction Costs			39,800
1) Improvements to Land		$ 1,765	
Includes service roads, parking areas, fencing, lighting, stripping, backfill, topsoil, seed and landscaping			
2) Buildings		1,930	
3) Special Facilities		33,455	
a) Equipment	13,760		
b) Storage Basins	2,500		
c) Piping, Ductwork and Insulation	11,345		
d) Instruments	2,975		
e) Electrical	2,875		
4) Utilities		$ 2,650	
C. Removal costs			200
Subtotal (Items A&B&C)			$ 44,500
D. Contingencies at approximately 10% of above costs			4,500
E. Design and construction liaison, testing, checkout and acceptance			1,000
Total Estimated Costs			$ 50,000

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d/ Based on completed conceptual design. Currently being updated to reflect subsequent design development.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Effluent treatment facility
Savannah River, South Carolina

2. Project No. 86-D-154

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11. Method of Performance:

Design will be performed by a subcontractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1986	FY 1986 Reprogramming	FY 1987	FY 1988	FY 1989	Total
A. Total Project Funding							
1) Total Facility Costs							
a) Construction Line Item	$ 0	$ 2,500	$ 3,950	$12,500	$19,250	$11,850	$50,000
b) PE&D	0	0	0	0	0	0	0
c) Expense Funded Equipment	0	0	0	0	0	0	0
d) Inventories	0	0	0	0	0	0	0
Total Facility Costs	$ 0	$ 2,500	$ 3,900	$12,500	$19,250	$11,850	$50,000
2) Other Project Funding							
a) R&D necessary to complete construction	$ 6,500	$ 2,000	$ 0	$ 0	$ 0	$ 0	$ 8,500
b) Conceptual design	1,010	350	0	100	100	100	1,660
c) Other project related costs	900	1,500	0	3,000	2,000	2,000	9,400
Total other Project Funding	$ 8,410	$ 3,850	$ 0	$ 3,100	$ 2,100	$ 2,100	$19,560
Total Project Funding	$ 8,410	$ 6,350	$ 3,900	$15,600	$21,350	$13,950	$69,560

B. Total Related Funding Requirement (estimated life of project is 30 years) e/

1) Facility Operating Costs..	$6,260
2) Programmatic operating expenses directly related to the facility......................	0
3) Capital equipment not related to construction but related to the programmatic effort in the facility..	60
4) GPP or other construction related to programmatic effort in the facility.............	0
Total other related annual funding requirements..	$6,320

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e/ Annual cost in FY 86 dollars.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Effluent treatment facility
Savannah River, South Carolina

2. Project No. 86-D-154

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total Project Funding
  1) Total Facility Costs
    a. Construction Line Item - No narrative required.
    b. PE&D - None
    c. Expense Funded Equipment - None
    d. Inventories - None
  2) Other Project Funding
    a. R&D necessary to complete construction - provides for development and testing of effluent treatment processes including reverse osmosis, ultrafiltration, and ion exchange
    b. Conceptual design - Includes engineering studies, wastewater characterization, soil analysis, preparation of cost estimates, and improving equipment design.
    c. Other project related costs--Plant liaison prior to authorization and operation of pilot scale units after design--is complete for process optimization, development of procedures, and operator training..

B. Total Related Funding Requirements
  1) Facility Operating Costs - This project will require additional personnel (26 operating and support personnel) to operate on a 7-day, 4-shift schedule; plus annual expenditures for energy and raw materials.
  2) Programmatic Operating Expenses Directly Related to the Facility - None
  3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the facility - Includes replacement of pumps, filters, etc.
  4) GPP or other Construction Related to Programmatic Effort - None.
  5) Other Costs - None

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and location of project: Plantwide safeguards systems, Savannah River, South Carolina

2. Project No.: 86-D-156

3. Date A-E initiated: 1st Qtr. FY 1986

3a. Date physical construction starts: 4th Qtr. FY 1986

4. Date construction ends: 1st Qtr. FY 1990

5. Previous cost estimate: $50,000
Less amount for PE&D: 0
Net cost estimate: $50,000
Date: 5/84

6. Current cost estimate: $50,000
Less amount for PE&D: 0
Net cost estimate: $50,000
Date: 5/85

7. Financial Schedule:

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	3,000	3,000	3,000	1,000
1986 Sequestered	0	(290)	(290)	(100)
1987	13,610	13,900	13,900	9,200
1988	16,790	16,790	16,790	19,200
1989	9,300	9,300	9,300	12,900
1990	7,300	7,300	7,300	7,800

8. Brief Physical Description of Project

This project provides plantwide safeguards upgrades in the broad areas of physical security alarm systems, personnel/vehicle access controls, and Special Nuclear Materials (SNM) accountability. Specific subprojects are described below:

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1. Title and location of project: Plantwide safeguards systems
Savannah River, South Carolina

2. Project No.: 86-D-156

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8. Brief Physical Description of Project (Cont'd)

A. Security Control and Alarm Center (CAC)

A new CAC (approximately 4,500 sq. ft.) will be constructed. The CAC shall include state-of-the-art alarm monitoring equipment with remotely located redundant security computers, automated closed circuit television (CCTV) surveillance systems, communications, and remote personnel access control capability with historical files. High system reliability will be provided by installing redundant alarm monitoring hardware. Access control hardware will be installed in selected security locations within the 300/700 Area. After installation of the new CAC, equipment within the existing obsolete CAC will be removed.

B. Emergency Management Center (EMC) [a]

An Emergency Management Center (EMC) will be constructed within the 300/700 Area. The EMC (approximately 12,400 sq. ft.) shall contain a Plantwide Alternate Alarm Center (PAAC) and an expanded Emergency Operations Center (EOC). The PAAC will contain redundant equipment as backup to the alarm monitoring capability of the CAC's in the reactor areas and in H, F, and 300/700 Areas. Tie-ins to existing high speed communications channels will provide data links between the EMC and each remote CAC. The EOC portion of the EMC shall contain communications and information management and display systems necessary for plant management to handle any site emergency. This includes coordination functions with DOE, plant operations, and local, federal, and state agencies.

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[a] Replaces Plantwide Alternate Alarm Center previously listed as subproject.

1. Title and location of project: Plantwide safeguards systems
Savannah River, South Carolina

2. Project No.: 86-D-156

8. Brief Physical Description of Project (Cont'd)

C. Entry Control Facilities

New entry control lanes and card readers will be installed within the front entrance lobby of the main Administration Building (703-A). An entry control building of approximately 2,600 sq. ft. will be installed at the rear access control point of the building.

D. Plantwide Access Enrollment System [b/]

A computerized Plantwide Access Enrollment System (PAES) will be installed within an approximately 1,300 sq. ft. addition to the Visitor Control Section (VCS), Building 703-A. The PAES will include computers, files, and other equipment necessary to register personnel into the new plantwide entry control system. Enrollment stations will be installed at several site locations. After authorization, enrolled personnel data will be automatically downloaded to the proper area Control and Alarm Center (CAC) access control file. All data transmissions will be encoded.

E. Special Nuclear Materials Monitors

Monitors will be installed in multiple plant production areas to survey solid waste trash (i.e., cloth wipes, paper, gloves, etc.) which may contain very low level radioactive contamination. This low level waste is stored in cardboard boxes prior to transport from a production area. The waste monitors will provide a go, no-go decision for the transport of boxed waste out of a production area and provide additional assurance that Special Nuclear Material does not exit a production facility via trash waste processing.

F. Accountability Instrumentation

High accuracy specific gravity and level instrumentation will be installed within tanks at the product feed (input) end of the Separations Building 221-F, B-Line, plutonium production facility. Mixing pumps and process measurement instrumentation will be provided. Readouts will be provided within the existing control room. Existing tank instrumentation will be removed.

[b/] New subproject.

1. Title and location of project: Plantwide safeguards systems
Savannah River, South Carolina

2. Project No.: 86-D-156

9. Purpose Justification of Need for, and Scope of Project

The purpose of this project is to provide upgraded Savannah River Plant (SRP) safeguards systems to meet specific requirements and performance standards specified in DOE Order 5632.2, DOE Order 5632 (Draft), DOE Site Order 563X.5 for the protection of SNM, and increased requirements for more accurate accountability of SNM.

Recent increases in the perceived threat level to DOE facilities have resulted in increased security measures and increased performance requirements for security CAC's. The new 300/700 Area CAC and equipment will accomplish the security performance upgrades required for the 300/700 Area. The existing 300/700 Area CAC system cannot be effectively expanded or enhanced to meet these new requirements; and therefore, it must be replaced. Existing CAC's in the Reactor Areas (C, P, K, and L) are presently being replaced/upgraded under Project 82-D-127. Existing CAC's in F and H Separations Areas will be replaced utilizing funding under Project 84-D-134 in order to provide alarm point capacity to meet immediate needs for security projects already scheduled within these areas.

DOE Orders 5632.2 and 5632 (draft) establish the requirement for an alternate alarm center to provide a separate indication of alarms and to initiate a response in the event of incapacitation of the primary alarm center (CAC). The Emergency Management Center (EMC) will provide a redundant and independent alarm monitoring and response initiation capability for each CAC in C, P, K, L, H, F, and the 300/700 Areas. In the event of incapacitation of any CAC, the EMC will be able to direct security response forces. The EMC system will use software cross-checks to monitor the responses of CAC operators for abnormal conditions. A plantwide overview of SRP's security status will be maintained in the EMC. The EMC will have communications facilities to security forces, Department of Energy, plant management, and specified state and local agencies. The EMC concept is to greatly reduce the probability that a single act will eliminate the capability to monitor the status of SNM protection systems.

1. Title and location of project: Plantwide safeguards systems
Savannah River, South Carolina

2. Project No.: 86-D-156

9. Purpose Justification of Need for, and Scope of Project (Cont'd)

Expansion of the Emergency Operations Center (EOC) as part of the EMC facility is required to effectively coordinate security and operational requirements with the greatly increased regulatory and statutory interface requirements with DOE and local, state, and federal agencies. The integration of security (PAAC) and traditional EOC functions into the EMC is deemed imperative in the overall objective of maintaining a safe nuclear production environment and protecting the public welfare.

Improved equipment for boxed waste monitoring is needed in production facilities on a plantwide basis. Commercial analyzer electronics are available to perform the counting/assay task; however, the equipment is not packaged and integrated with physical security controls to function as a stand-alone unit. An integrated monitoring system must be developed. After assay and clearance for transport, the monitor must also transfer the boxed waste through the security barrier wall without compromising the physical integrity of the wall.

The proposed Separations Building 221-F, B-Line instrumentation is required to provide a more accurate estimate of plutonium (SNM) received into the B-Line process from the canyon process. These improved measurements combined with other upgraded SNM input/output measurements will increase the overall accuracy of Savannah River Plant's SNM accountability program.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Plantwide safeguards systems
Savannah River, South Carolina

?. Project No.: 86-D-156

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10. Details of Cost Estimate c/

Item			Item Cost	Total Cost
A. Engineering, inspection, and design at approximately 33% of construction costs, Item B.				$ 9,700 d/
B. Construction costs				29,100
1) Improvements to land including roads, walks, fences, excavation grading, landscaping, erosion, and backfill			$ 100	
2) Buildings			5,000	
a. 300/700 area control and alarm center (4,500 SF)		$1,100		
b. Entry control fac. bldg. 703-A admin area (1,800 SF)		500		
c. Building 703-A addition, VCS enrollment system (1,300 SF)		170		
d. Emergency management center (12,400 SF) (Excl. renovations to building 703-A, A and B wings)		3,000		
e. Boxed waste handling fac., bldg. 326-M (1,800 SF)		230		
3) Special facilities			23,400	
a. H&V equipment		1,400		
b. Mechanical equipment		680		
c. Electrical equipment		3,370		
d. Security systems		12,200		
e. ADP computer systems		5,750		
o 3/700 area ADP system	$1,650			
o Emergency management center ADP system	3,300			
o Access enrollment ADP system	800			
4) Utilities			600	
C. Removal costs				3,300
Subtotal				42,100
D. Contingency at approximately 18% of above cost				7,400
E. Allowance for design and construction liaison, testing, checkout, and acceptance				500
Total project cost				$ 50,000

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c/ The above estimates are based on completed conceptual design.

d/ Computerized security and access control systems requiring significant detailed engineering design effort and software development.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Plantwide safeguards systems
Savannah River, South Carolina

2. Project No.: 86-D-156

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11. Method of Performance

Design will be performed by both the operating contractor and negotiated architect-engineer contracts. Construction and procurement will be accomplished by the operating contractors, utilizing fixed-price subcontractors awarded on the basis of competitive bidding to the extent feasible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	Total
A. Total project costs								
1) Total facility costs								
a. Construction line item	$ 0	$ 0	$ 900	$ 9,200	$19,200	$12,900	$ 7,800	$50,000
b. Plant engineering and design (PE&D)	0	0	0	0	0	0	0	0
c. Expense funded equipment	0	0	0	0	0	0	0	0
d. Inventories	0	0	0	0	0	0	0	0
Total facility costs	$ 0	$ 0	$ 900	$ 9,200	$19,200	$12,900	$ 7,800	$50,000
2) Other project costs								
a. R&D necessary to complete construction	$ 0	$ 300	$ 300	$ 0	$ 0	$ 0	$ 0	$ 600
b. Conceptual design	0	900	0	0	0	0	0	900
c. Other project related costs	0	210	2,760	0	0	800	200	3,970
Total other project costs	$ 0	$1,410	$ 3,060	$ 0	$ 0	$ 800	$ 200	$ 5,470
Total project costs (Items 1 and 2)	$ 0	$1,410	$ 3,960	$ 9,200	$19,200	$13,700	$ 8,000	$55,470

B. Total related cost requirements (estimated life of project - 20 years)

	Annual Cost
1) Facility operating costs	$1,500
2) Programmatic operating expenses directly related to the facility	0
3) Capital equipment not related to construction but related to the programmatic effort in the facility	0
4) GPP or other construction related to the programmatic effort in the facility	0
5) Other costs	0
Total other related annual cost requirements	$1,500

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Plantwide safeguards systems
Savannah River, South Carolina

2. Project No.: 86-D-156

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project costs
   1. Total facility costs
      a. Construction line item - No narrative required.
      b. Plant Engineering and Design (PE&D) - None
      c. Expense funded equipment - None
      d. Inventories - None
   2. Other project costs
      a. R&D necessary to complete construction - Experimental boxed waste monitors must be developed and tested prior to specifying project equipment.
      b. Conceptual design - Includes funds to prepare cost estimates.
      c. Preliminary engineering studies and preliminary design in preparation for project authorization. Development of some specialized security system software and computer system planning documentation in preparation for project authorization. Checkout of computer system installation.

B. Total related cost requirements

These costs are associated with the following additional requirements:
- Three new security posts associated with operation of security facilities.
- Annual security system maintenance costs.
- Utility and supply costs for operating the new facilities.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and Location of Project: Hydrofluorination system - FB-Line
Savannah River, South Carolina

2. Project No. 86-D-157

3. Date A-E work initiated: 3rd Qtr. FY 1986

3a. Date physical construction starts: 2nd Qtr. FY 1987

4. Date construction ends: 2nd Qtr. FY 1989

5. Previous cost estimate: $10,000
Date: 1/84

6. Current cost estimate: $ 9,200 a /
Date: 6/85

7. Financial Schedule

Fiscal Year	Authorization	Appropriation	Obligations	Costs
1986	$ 2,200	$ 2,200	$ 2,200	$ 750
1986 Sequestered	0	(200)	(200)	(70)
1987	2,310	2,510	2,510	3,120
1988	2,950	2,950	2,950	3,200
1989	1,740	1,740	1,740	2,200

8. Brief Physical Description of Project

This project will provide facilities to hydrofluorinate PuO_2 to PuF_4 using existing and planned M-9 process furnaces in the Separations FB-Line Plutonium Finishing Facility. Specific scope elements of the project are:

- o A new anhydrous hydrogen fluoride (HF) feed gas facility containing two banks of HF cylinders, with remote control valving, and a gas scrubbing system.
- o Modifications to the M-9 roasting furnace including an additional HF feed line, automatic feed controls and an enclosure for the HF feed control valves.
- o Construction of an off-gas scrubbing system including:
  - -A stainless steel lined equipment enclosure room.
  - -KOH scrubber tanks and pumps.
  - -Vacuum exhausters and heat exchangers.
  - -A KOH make-up tank and pump.

All work will be located within or adjacent to the existing FB-Line facility. FY 1987 funds will be used to begin construction and continue procurement and design.

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a/ Reflects reduced escalation forecast.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Hydrofluorination system - FB-Line
Savannah River, South Carolina

2. Project No. 86-D-157

9. Purpose, Justification and Need for, and Scope of Project

Hydrofluorination facilities in the FB-Line will provide capability for handling clean plutonium oxide feed in the FB-Line without dissolution or canyon processing and reduce personnel radiation exposure. It will further provide greater DOE system-wide versatility for processing plutonium scrap and residues by providing a method for relieving the new Special Plutonium Recovery Facility from processing high grade oxide feed, thus allowing it to be utilized for processing slower, leaner plutonium residues. These facilities will include a hydrogen fluoride feed gas system, an off-gas scrubbing system, and special equipment, (e.g. hydrofluorination pans).

The objectives of this project are:

- Provide a near direct route for converting purified PuO_2 to weapons grade material. Hydrogen fluoride is used to convert PuO_2 to a PuF_4/PuO_2 mixture suitable for calcium reduction to plutonium metal. This would free recovery processing routes to handle more difficult to process material.

- Reduce FB-Line personnel radiation exposure by approximately 40% per unit of material processed by bypassing special recovery, canyon, and FB-Line wet chemistry operations.

- Provide the FB-Line with the option of converting to an oxalate precipitation/hydrofluorination flowsheet with a resulting 90% and 50% reduction in neutron emissions at the precipitators and conversion furnaces, respectively.

10. Details of Cost Estimate b/

		Item Cost	Total Cost
A. Engineering design at 35% of construction costs			$ 1,900
B. Construction costs			5,370
1) Building		$ 220	
2) Special Facilities		5,150	
a) Equipment	$1,730		
b) Piping	1,170		
c) Electrical	430		
d) Instruments	1,820		
C. Removal and maintaining production costs			250
Subtotal (Items A, B, and C)			$ 7,520

b/ This estimate is based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Hydrofluorination system - FB-Line
Savannah River, South Carolina

2. Project No. 86-D-157

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10. Details of Cost Estimate (Con'd)

D. Contingencies at approximately 19% of above costs ..	$ 1,430
E. Design and construction liaison, testing checkout and acceptance	$ 250
Total Estimated Cost	$ 9,200

11. Method of Performance

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontractors awarded on the basis of competitive bidding to the extent feasible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	TOTAL
A. Total project costs						
1) Total facility costs						
a) Construction line item	$ 0	$ 680	$ 3,120	$ 3,200	$ 2,200	$ 9,200
b) PE&D	0	0	0	0	0	0
c) Expense funded equipment	0	0	0	0	0	0
d) Inventories	0	0	0	0	0	0
Total facility costs	0	$ 680	$ 3,120	$ 3,200	$ 2,200	$ 9,200
2) Other project costs						
a) R&D	$ 2,200	$ 420	$ 400	$ 280	$ 150	$ 3,450
b) Other project related cost	0	0	0	0	0	0
Total Other Project Costs	$ 2,200	$ 420	$ 400	$ 280	$ 150	$ 3,450
Total Project Costs	$ 2,200	$ 1,100	$ 3,520	$ 3,480	$ 2,350	$12,650

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Hydrofluorination system - FB-Line
Savannah River, South Carolina

2. Project No. 86-D-157

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12. Funding Schedule of Project Funding and Other Related Funding Requirements (Cont'd)

B. Other Related Annual Costs (estimated life of project is 20 years)

	Annual Cost
1) Facility Operating Costs	$ 0
2) Programmatic Operating Expense Directly Related to the Facility	0
3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	7
4) GPP or other Construction Related to the Programmatic Effort in the Facility	7
5) Other Costs	0
Total Related Annual Costs	$ 14

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project funding
1. Total facility costs
   a) Construction line item - No narrative required.
   b) PE&D - None.
   c) Expense funded equipment - None.
   d) Inventories - None.

2. Other project costs

   a) R&D - Includes $775,000 for conceptual design and engineering studies.
   b) Other projected related costs - none.

B. Total related funding requirements:
1. Facility operating costs - This project provides a process to bypass some current FB-Line operations. Operating and supporting staff, and materials and energy requirements are essentially unchanged.
2. Programmatic operating expenses directly related to the facility - None.
3. Capital equipment not related to construction but related to the programmatic effort in the facility - Estimated cost to replace capital equipment such as pumps and instruments.
4. GPP or other construction related to programmatic effort in the facility - Cost to update or improve items.
5. Other costs - None.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars)

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1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

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3. Date A-E work initiated: 2nd Qtr. FY 1985

3a. Date physical construction starts: 1st Qtr. FY 1987

4. Date construction ends: 4th Qtr. FY 1992

5. Previous cost estimate: $270,000
Date: 12/84

6. Current cost estimate: $270,000
Less amount for PE&D: 0
Net cost estimate $270,000
Date: 12/85

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7. Financial Schedule:

FISCAL YEAR	AUTHORIZATIONS	APPROPRIATIONS	OBLIGATIONS	COSTS
1985	$ 10,000 a/	$ 10,000a/	$ 10,000a/	$ 8,200
1986	12,000	15,000	15,000	13,000
1986 Sequestered	0	(1,470)	(1,470)	(1,470)
1987	36,530	35,000	35,000	20,780
1988	71,470	71,470	71,470	46,470
1989	65,000	65,000	65,000	60,000
1990	60,000	60,000	60,000	55,000
1991	15,000	15,000	15,000	40,000
1992	0	0	0	28,000

8. Brief Physical Description of Project:

The Idaho Fuels Processing Facility (IFPF) supports the nation's defense by processing Naval nuclear propulsion fuels and thus closes the Navy's fuel cycle while providing fuel for the Department of Energy's production reactors. The Navy has forecasted a 40-year mission for the IFPF which will increase its base processing load substantially beyond present capacity.

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a/ Limited to design activities only.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

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8. Brief Physical Description of Project: (continued)

The Fuel Processing Restoration (FPR) project will replace portions of the deteriorated main processing facility solvent extraction systems with new facilities and process systems that will meet current codes and standards, and the demands of projected fuel processing loads. The resulting facilities will be designed to provide a minimum recovery rate of Uranium-235 per day to meet requirements, be capable of concurrent or sequential uranium recovery operation, have adequate intercycle and product storage or surge capacity to support concurrent or sequential modes, minimize personnel radiation exposures, minimize the spread of radioactive and chemical contamination, improve criticality safety, increase process availability, and minimize the release of radioactive effluents to the environment. The project will provide remote maintenance/replacement capabilities in those portions of the solvent extraction process which, due to high radiation hazards, decontamination time, and historically high maintenance requirements, cannot otherwise achieve the required process availability. Finally, the project will reduce the volume of liquid service waste water disposed of by means of the percolation ponds. After the FPR Project is completed, an alternate disposal system will receive a reduced volume of cleaner (i.e., less contaminated chemically and radiologically) effluent from the recycle and cleanup systems of the IFPF provided by the FPR project.

All new facilities, structures, and process cells provided by this project will be constructed of reinforced concrete, and will be arranged by process function. New cells will be designed to be compatible with existing cells (e.g., isolated and below grade); and constructed to optimize material flows, provide ready but controlled personnel access, optimize remote handling and maintenance capabilities, minimize overall floor area, and meet all credible natural phenomena design requirements. As necessary, the new facilities and process systems will include supporting systems including control rooms and control stations, health physics offices, electrical switchgear, maintenance areas, process make-up areas, chemical storage areas, overhead bridge cranes and bridge-mounted manipulators. Additional cells and specified areas will also be provided for radioactive liquid waste handling systems, process and ventilation air supply and exhaust systems, and process sampling. A combination of remote and direct maintenance techniques will be employed in the new facilities. Direct maintenance equipment/areas will be limited to pipes, columns, tanks, and similar items not expected to require maintenance or replacement for many years. Remote maintenance/replacement will be provided for failure-prone items to aid in

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

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8. Brief Physical Description of Project: (continued)

decontamination, replacement, and maintenance activities, thereby decreasing process down time, facility and process decontamination time, liquid and solid waste generation rates, and needless personnel radiation exposures. Remote maintenance areas will be provided with shielding windows for direct viewing; manipulators for remote handling and maintenance; and ports and hatches for access, TV viewing, the introduction of tools and specified equipment, and replacement of major items of equipment.

All efforts related to this project will incorporate the latest proven engineering and technology to ensure process reliability and availability, minimize the release of radioactive and chemical effluents to the environment, minimize personnel radiation exposure, ensure criticality safety, increase throughput capacity, and improve solvent recovery capability. The entire process will incorporate improved security and safeguards systems and improved sampling and accountability provisions.

The budget authority level requested in FY 1987 of $35 million is for the continuation of definitive design activities and long-lead equipment procurement activities and the initiation of construction activities.

9. Purpose, Justification of Need for, and Scope of Project:

The IFPF was designed and built in the early 1950's to demonstrate fuel processing technologies and to support DOE's Nuclear Materials Production Program. Using the techniques and standards existing at that time, the plant was built as a 5-year demonstration facility. However, it has operated successfully for 30 years as a production facility. Over the plant's operating years, many modifications and additions have been made to provide a facility capable of safely meeting DOE's fuel processing needs. As a result, the plant continues to operate in a manner that ensures safety to plant personnel and the public.

However, today's philosophy encourages: (a) further reductions in personnel radiation exposures to as-low-as-reasonably-achievable (ALARA) levels; (b) physical rather than administrative methods of preventing criticality; (c) improved cleanup and control of effluent releases; and (d) more intensified security and product accountability measures. In addition to these changes in philosophy, the most recent IFPF fuel receiving forecasts indicate IFPF's operating mission extending to at least the year 2028. These forecasts project not only a longer plant operating mission, but also dramatic increases in the plant's future fuel processing requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

9. Purpose, Justification of Need for, and Scope of Project: (continued)

To enable the IFPF to meet its identified mission, seven improvement objectives that the IFPF process systems and facilities must meet have been defined: (1) provide safe and timely uranium recovery operations; (2) provide reduced criticality risks for long-term uranium recovery operations; (3) provide features that achieve as-low-as-reasonably-achievable (ALARA) radiation exposure to plant personnel; (4) provide fuel recovery structures, systems, and equipment that meet applicable natural phenomena standards, codes, and safety criteria; (5) provide systems to maintain radioactive and chemical releases to the environment at or below acceptable limits; (6) provide enhanced safeguards and security systems; and (7) provide flexible fuel processing capability. Recently, several IFPF processes have been replaced with new facilities and systems that meet these seven mission and improvement objectives. For example, the new FLUORINEL Dissolution and Storage Facility (Project 77-13-a) will provide the facilities and systems needed to meet projected fuel receiving, storage, and dissolution requirements. The recently commissioned New Waste Calcining Facility (NWCF) provides systems to safely solidify radioactive wastes. However, for the uranium recovery process systems and facilities between dissolution and calcination, little work has been performed to provide a long-term, highly reliable capability to recover uranium from dissolved irradiated fuels.

Past IFPF practice has also included the disposal of large volumes (approximately 3,000,000 gallons per day) of service waste liquids to the aquifer through an IFPF injection well. The discharged liquids are normally relatively clean, but do contain small amounts of both chemical and radioactive waste. In the event of a "worst case" failure such as a process system heat exchanger tube failure, gross amounts of radioactive liquids could be discharged to the percolation ponds, which were recently constructed to eliminate the need for the injection well.

The FPR project will include recycle or closed loop water cooling systems, chemical treatment and recycle systems, and effluent regeneration and reuse systems. Through these measures and systems, essentially all liquid effluent streams will be cleaned up, recycled, or reused to eliminate the need for the percolation ponds to dispose of liquid effluents. These systems will become an integral part of the FPR and will be designed and sized to integrate with other IFPF operating systems and facilities as well as the FPR.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

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9. Purpose, Justification of Need for, and Scope of Project: (continued)

To correct the problems and conditions identified, the FPR project, with state-of-the-art engineering, would provide systems, facilities, and features that meet today's codes, standards, and requirements. Implementation of the FPR project is expected to yield significant savings in several areas including: (1) a reduction in personnel radiation exposures of approximately 70 man-rem/yr, (2) a reduction in major plant shutdowns, (3) a reduction in the volume of contaminated liquid wastes generated, and (4) a decrease of several hundred minor miscellaneous contamination incidents per year. For the IFPF to meet its improvement objectives and its defined operating mission, the FPR project is vitally needed to provide the necessary operating continuity and process reliability. A delay in the initiation of construction activities on the FPR project beyond FY 1987 would be costly in terms of the reduced amount of uranium processed; the increase in the number and extent of personnel radiation exposures; the increase in volume of decontamination and clean-up wastes generated; the increase in operating costs; and the increase in the project cost.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho	2. Project No. 85-D-139

10. Details of Cost Estimate: b/

	Item Cost	Total Cost
a. Engineering, design, inspection and project administration costs at approximately 26% of construction costs, item b		$ 47,600
b. Construction costs		183,200
1. Improvements to land including grading, landscaping, drainage diversion, paving and parking	400	
2. Buildings		
(a) Fuel Processing Facility, 140,000 sq. ft. at $336 per sq. ft.	47,100	
3. Other structures		
(a) Exhaust stack	200	
4. Special Facilities		
(a) Process systems equipment; i.e., vessels, valves, pump	15,200	
(b) Process piping	36,000	
(c) Instrumentation: process, HVAC	19,000	
5. Utilities, including electrical power, water, sanitary sewer lines, compressed air, heat and process steam lines, condensate return lines.	22,800	
6. Special equipment, including shielding windows and doors, material handling equipment, major process equipment	37,900	
c. Major computer items include computer and distributed control system		4,200
d. Demolition		400
Subtotal (Items a & b)		230,800
e. Contingency at approximately 17% of above costs		$ 39,200
Total Project Costs		$270,000

11. Method of Performance:

Design will be awarded on the basis of technical evaluation. Construction, and procurement will be accomplished by prime contracts and/or subcontracts awarded on the basis of competitive bidding.

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b/ The above cost estimate is based on a completed advanced Conceptual Design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

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12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Y ears	FY1985	FY1986	FY1987	FY1988	FY1989	FY1990	FY1991	FY1992	FY1993	FY1994	Total
A. Total project funding												
(1) Total facility costs												
(a) Construction Line Item	$ 0	$ 9,000	$11,530	$20,000	$46,470	$60,000	$55,000	$40,000	$28,000	$ 0	$ 0	$270,000
(b) PE&D	0	0	0	0	0	0	0	0	0	0	0	0
(c) Expense Funded Equipment	0	0	0	0	0	0	0	0	0	0	0	0
(d) Inventories	0	0	0	0	750	1,200	1,500	400	0	0	0	3,850
Total Facility Costs	$ 0	$ 9,000	$11,530	$20,000	$47,220	$61,200	$56,500	$40,400	$28,000	$ 0	$ 0	$273,850
(2) Other Project Funding												
(a) R&D Necessary to Complete Construction	$12,604	$ 2,215	$ 850	$ 400	$ 200	$ 50	$ 0	$ 0	$ 0	$ 0	$ 0	$ 16,319
(b) Other Project Related Costs	0	2,430	3,180	4,770	5,440	5,610	5,470	6,660	7,540	$10,150	$ 9,530	60,780
Total Other Project Funding	12,604	4,645	4,030	5,170	5,640	5,660	5,470	6,660	7,540	$10,150	$ 9,530	77,099
Total Project Funding	$12,604	$ 13,645	$15,560	$25,170	$52,860	$66,860	$61,970	$47,060	$35,540	$10,150	$ 9,530	$350,949

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

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12. Funding Schedule of Project Funding and Other Related Funding Requirements: (continued)

B. Total Related Funding Requirements: (Estimated Life of Project: 40 years) c/

1. Facility Operating Costs	$ 0/year
2. Programmatic Operating Expenses Directly Related to the Facility	$ 0
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	$ 0
4. GPP or Other Construction Related to Programmatic Effort in the Facility	$ 0
Total Related Annual Funding Requirements	$ 0

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

A. Total Project Funding

1. Total Facility Costs

a. Construction Line Item - No narrative required

b. P&ED - No narrative required

c. Expense Funded Equipment - No narrative required

d. Inventories - The FPR inventories will include uninstalled and replacement spares of pumps, motors, valves, blowers, etc., that will be needed to insure a successful facility startup and cold operation.

2. Other Project Funding

a. R&D necessary to complete construction - Approximately $1,400,000 was expended on equipment and process research and development (R&D) activities in prior years. An additional $3,715,000 will be needed to support the remaining R&D in FY 1985 through FY 1989. Through FY 1984, approximately $11,204,000 was spent on the preconceptual, conceptual, and advanced conceptual design efforts.

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c/ Operating costs and programmatic costs for the restored facility will not change from that presently budgeted for the existing processing facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-139

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements: (continued)

b. Other Project Related Costs - Approximately $60,780,000 will be spent on project support (project engineering, design review, documentation, etc.), operator training and facility startup. Project support will extend through design, construction, and startup.

B. Total Related Funding Requirements

No incremental change in funding is required for programmatic operation of the restored facility.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative in whole dollars.)

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1. Title and location of project: Productivity and radiological improvements, Feed Materials Production Center, Fernald, Ohio

2. Project No. 85-D-140

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3. Date A-E work initiated: 2nd Qtr. FY 1985

3a. Date physical construction starts: 4th Qtr. FY 1985

4. Date construction ends: 2nd Qtr. FY 1989

5. Previous cost estimate: $47,000
Date: 8/83

6. Current cost estimate: $47,000
Less amount for PE&D: 0
Net cost estimate: $47,000
Date: 12/85

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7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 6,000	$ 3,000	$ 3,000	$ 788
1986	12,000	15,000	15,000	12,000
1987	23,500	23,500	23,500	22,500
1988	5,500	5,500	5,500	10,712
1989	0	0	0	1,000

8. Brief Physical Description of Project [a/]

This project provides for the replacement of equipment and systems to assure continued and safe operation of the Department of Energy's Feed Materials Production Center at Fernald, Ohio. This includes:

Plant	Description
2	Improved slag leach filtration and vacuum system relocated in the digestion area.
2	Improved method of loading, ventilation, and instrumentation for the metal dissolver.
3	Revisions to the U03 gulping, milling, sampling and packaging systems relocated in the digestion area.
4	Environmental and safety improvements for the Tank Farm.

[a/] Previously indicated improvements to the column digesters, refinery instrumentation, feed controls and conveyors, and materials handling between Plants 4 & 5 have been deleted.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Productivity and radiological safety improvements, Feed Materials Production Center, Fernald, Ohio

2. Project No. 85-D-140

8. Brief Physical Description of Project (cont'd)

4	Redesign and replacement of Fluid Bed Furnaces.
4	Modification to the HF off-gas system and the HF recovery system replacement.
5	Upgrade "F" machines
8	New oxidation furnaces for residues of 3 to 4% U-235, upgrade existing furnace for 1.25% U-235, replacement of a box furnace, and a mid-size mill.
8	Replace and upgrade rotary kiln.
Plantwide	Stack monitoring systems.
1	New drum reconditioning system and uranium control pad.

FY 1987 funds will be used to continue procurement and construction.

9. Purpose, Justification of Need for, and Scope of Project

Equipment and safety improvements are required at the Feed Materials Production Center (FMPC) to ensure the continued capacity to meet programmatic needs and increasingly stringent radiological and industrial safety requirements. The FMPC produces depleted and slightly enriched uranium for the nuclear material production reactors. The plant was built in the early 1950's and has had no substantial physical or technological renovation since that time. Consequently, it is becoming obsolete in areas such as control systems, power supplies, materials handling, and environment controls.

Much of the instrumentation for process control is outdated. Reliable instrumentation is essential for proper operation monitoring and for immediate detection of inadvertent uranium releases. New electronic systems with servomechanisms are required, particularly for the extraction process. Similarly, the ducting for the present UO3 packaging system is such that dust losses sometimes occur and become airborne at transition sections between system components. Upgrading of the UO3 handling system is required to assure product quality and to maintain ALARA levels for operating personnel.

Some basic process steps also need to be changed. For example, certain uranium residues can not currently be digested in nitric acid without excessive fuming and/or foaming. A more versatile digester will be provided which will overcome the fuming/foaming Nox problems by restricting the feed and acid quantities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Productivity and radiological safety improvements, Feed Materials Production Center, Fernald, Ohio

2. Project No. 85-D-140

10. Details of Cost Estimate a/

	Item Cost	Total Cost
A. Engineering, design, and inspection costs for Titles I, II and III at approximately 20% of Item B.		$ 6,500
B. Construction Costs		31,100
1) Building modifications	$ 700	
2) Special facilities	21,100	
3) Other structures	9,300	
Subtotal		37,600
C. Contingency @ approximately 25% of above cost		9,400
Total Estimated Cost		$47,000

11. Method of Performance

Design and inspection will be performed with a negotiated architect-engineer contract. To the extend feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

A. Total Project Funding

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
1. Total Facility Costs							
a) Construction line item..	$ 0	$ 788	$12,000	$22,500	$10,712	$ 1,000	$47,000
b) PE&D	0	0	0	0	0	0	0
c) Expense funded equipment	0	0	0	0	0	0	0
d) Inventories	0	0	0	0	0	0	0
Total Facility Costs ...	$ 0	$ 788	$12,000	$22,500	$10,712	$ 1,000	$47,000
2. Other Project Funding							
a) R&D necessary to complete construction	$ 861	$ 64	$ 0	$ 0	$ 0	$ 0	$ 925
b) Other project related costs	0	0	0	0	0	0	0
Total Other Project Funding..	861	64	0	0	0	0	925
Total Project Funding	$ 861	$ 852	$12,000	$22,500	$10,712	$ 1,000	$47,925

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a/ Based on completed conceptual design

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Productivity and radiological safety improvements,
Feed Materials Production Center, Fernald, Ohio

2. Project No. 85-D-140

12. Funding Schedule of Project Funding and Other Related Funding Requirements (Cont'd)

B. Total Related Funding Requirement (estimated life of projects: 10 years)

1) Facility Operating Costs	0
2) Programmatic Operating Expenses Directly Related to the Facility	0
3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0
4) GPP or Other Construction Related to Programmatic Effort in the Facility	0
5) Other Costs	0
Total Other Related Annual Funding Requirements	0

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total Project Funding
- 1) Total Project Costs
  - a) Construction line items funding - No narrative required
  - b) PE&D funding - None
  - c) Expense funded equipment - None
  - d) Inventories - None

- 2) Other Project Funding
  - a) R&D necessary to complete - Includes $452,000 developmental costs and $473,000 conceptual design costs.
  - b) Other project related costs - None

B. Total Related Funding Requirements
- 1) Facility Operating Cost - Operating costs will be reduced slightly
- 2) Programmatic Operating Expenses Directly Related to the Facility - No change
- 3) Capitol Equipment not Related to Construction but related to the programmatic effort in the facility - None
- 4) GPP or Other Constructon - None
- 5) Other Costs - None

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and Location of Project: Fuel production facility[a/]
Savannah River, South Carolina

2. Project No. 85-D-145

3. Date A-E Work Initiated: 3rd Qtr. FY 1985 [d/]

3a. Date Physical Construction Starts: 3rd Qtr. FY 1986 [d/]

4. Date Construction Ends: 4th Qtr. FY 1989 [d/]

5. Previous Cost Estimate: $ 85,000
Date: 12/84

6. Current Cost Estimate: $ 85,000
Less Amount for PE&D 0
Net Cost Estimate $ 85,000
Date: 6/85

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligations	Costs
1985	$ 9,800 [b/]	$ 5,800 [c/]	$ 5,800 [c/]	$ 700
1986	16,000	18,000	18,000	15,100
1987	33,500	35,500	35,500	32,800
1988	25,700	25,700	25,700	21,900
1989	0	0	0	14,500

8. Brief Physical Description of Project:

This project provides a new facility at the Savannah River Plant to recycle enriched uranium and produce uranium oxide-aluminum billets for subsequent extrusion into reactor fuel tubes in a separate facility. The facility will

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[a/] New title for combined facility that will be constructed in lieu of separate line items 85-D-145 and 85-D-142.
[b/] Includes $8,000,000 authorized for 85-D-142 and $1,800,000 authorized for 85-D-145.
[c/] Includes $4,000,000 appropriated for 85-D-142 and $1,800,000 appropriated for 85-D-145.
[d/] Project delayed awaiting processing and approval of combined scope and by funding stretchout.

CONSTRUCTION PROJECT DATA SHEET

1.	Title and Location of Project:	Fuel production facility Savannah River, South Carolina	2. Project No. 85-D-145

8. Brief Physical Description of Project: (Cont'd)
eliminate the need to ship uranyl nitrate solutions to Oak Ridge Y-12 for reprocessing, and will replace the present SRP process of melting, casting, and machining U-Al metal alloy fuel cores. It will have the capability of converting oralloy, ICPP oxide, and the product of a proposed fuel improvements facility into uranyl nitrate in preparation for U_3O_8 production and will be designed to recycle 16 metric tons of uranium per year and provide fuel cores for four reactors.

This project will include a new 78,000 square foot building, containing a central processing area, a computer based control room, hardened vault, and other necessary service facilities. Approximately 50,000 square feet will be of high resistance construction and 28,000 square feet of standard construction. Ventilation facilities and a stack adequate to serve the building and process exhaust will be provided. Safety systems, including nuclear incident monitors and fire detection-suppression systems, will be installed. Utilities will include water and sewer, electricity, nitrogen supply, oxygen supply, process water, and steam.

Equipment will be provided for preparation and blending of uranyl nitrate feed with dissolved offsite oxide, conversion to U_3O_8 through a chemical/calcination process, grinding of U_3O_8 and blending with aluminum powders, compaction of the blend into fuel billet cores, assembly of cores into aluminum components, and welding of the assembled units before they are transferred to existing facilities for outgassing and extrusion into fuel tubes. Equipment will also be provided for recycle of process liquids, handling of liquid wastes, and treatment of process offgasses. Vault storage will be provided for offsite feed and U_3O_8 intermediate product.

All processing equipment will be housed in secondary enclosures or glove boxes to provide radiation shielding, containment, and filtered ventilation to prevent release of uranium oxide to the environment. The ventilation system will be designed to maintain temperature and humidity conditions necessary for the handling of the oxide and aluminum powders. Material handling equipment will be provided to assist the operators in moving process containers inside the cabinets. A computer system (exceeding $400,000) will be used to control process equipment and maintain an inventory of process materials.

FY 1987 funding will be used to continue construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Fuel production facility
Savannah River, South Carolina

2. Project No. 85-D-145

9. Purpose, Justification of Need for, and Scope of Project:

The conversion of uranyl nitrate to uranium oxide is a principal step in the recovery of enriched uranium from discharged reactor fuel. Recovery of this material is highly cost effective in that over $125 million per year of, otherwise required, feed material and separative work unit costs are avoided.

Conversion operations are presently performed in DOE's Y-12 Plant in Oak Ridge, Tennessee. The Y-12 facilities have been in use since 1959 and have reached the point where they are no longer capable of meeting the demands of continuous service. Existing processing equipment must be replaced and extensive system modifications made to reduce radiation exposure levels and improve nuclear materials accountability.

Cost-benefit analyses indicated that it will be cheaper to construct a new facility and centralize conversion operations at Savannah River than to attempt to upgrade the existing Y-12 facilities. Capital investment requirements will be higher for the new Savannah River facility but this initial outlay will be paid back upon startup through transportation and processing savings.

The construction of a new facility at Savannah River also provides several important benefits. It will allow cessation of over-the-road shipments of uranyl nitrate solution between Savannah River and Oak Ridge, thereby totally eliminating any possibility that a radioactive release could occur due to an in-transit accident or that operations could be halted by a truckers' strike. Under present operating conditions, the Savannah River H Canyon process can be maintained in operation for only a limited period of time if uranyl nitrate shipments are interrupted. It has been necessary to shut down the canyon process four times in the recent past due to such interruptions.

The new powder metallurgy (PM) process will replace the casting and machining process now used to form fuel billet cores from a U-Al metal alloy. PM will reduce fuel manufacturing costs, increase reactor productivity, reduce waste costs, and improve the working environment.

One-time savings at Savannah River include $800,000 in avoided capital in the casting/machining process, and $6,800,000 from fuel assembly redesign costs that would have been required for metal alloy fuel.

Total savings during the initial 20 years of operation are estimated to be $251,000,000 (in 1985 dollars), which includes: $54,000,000 in fuel tube fabrication; $50,000,000 in oxide production; $32,500,000 in avoided shipping expense; $39,400,000 in waste disposal; and $75,400,000 in reduced purchases of 93 percent enriched uranium feed. This equates to an average annual savings of $12,700,000 per year and a rate of return of 25 percent.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Fuel production facility
Savannah River, South Carolina

2. Project No. 85-D-145

10. Details of Cost Estimate: d/

	Item Cost	Total Cost
A. Engineering design at approximately 32% of construction costs, Item B		$ 17,130
B. Construction Costs		56,760
1. Site Preparation and Support Facilities	$ 9,470	
2. Manufacturing Building	6,700	
3. Building H&V and Other Equipment	9,000	
4. Uranium recycle line for production of U_3O_8	22,170	
5. Powder metallurgy line for core production	4,150	
6. Security and safeguards measures, including accountability	5,270	
C. Removal cost		610
Subtotal		74,500
D. Contingencies at approximately 17% of above costs		8,000
E. Design & construction liaison, testing, checkout and acceptance		2,500
Total project cost		$ 85,000

11. Method of Performance:

Design will be by the operating contractor. Construction and procurement will be by the operating contractor utilizing, to the extent feasible, fixed-price subcontracts awarded on the basis of competitive bidding.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Years	FY85	FY86	FY87	FY88	FY89	TOTAL
A. Total project costs							
1) Total facility costs							
a. Construction Line Item	$ 0	$ 700	$15,100	$32,800	$21,900	$14,500	$ 85,000
b. PE&D	0	0	0	0	0	0	0
c. Expense Funded Equipment	0	0	0	0	0	0	0
d. Inventories	0	0	0	0	0	0	0
Total Facility Costs	$ 0	$ 700	$15,100	$32,800	$21,900	$14,500	$ 85,000

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d/ Based on completed conceptual design

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Fuel production facility
Savannah River, South Carolina

2. Project No. 85-D-145

12. Funding Schedule of Project Funding and Other Related Funding Requirements: (Cont'd)

2) Other project costs

	Prior Years	FY 85	FY 86	FY 87	FY 88	FY 89	Total
a. R & D necessary to complete construction	$3,550	$3,300	$ 2,200	$ 300	$ 0	$ 0	$ 9,350
b. Conceptual Design	480	100	0	0	0	0	580
c. Engineering Studies	0	2,035	4,475	3,080	730	500	10,820
d. Other project related cost	600	500	1,080	1,210	1,800	2,190	7,380
Total other project costs	4,630	5,935	7,755	4,590	2,530	2,690	28,130
Total project costs	$4,630	$6,335	$22,855	$37,390	$24,430	$17,190	$113,130

B. Other related annual costs (Estimated life of facility= 25 yrs.)

	Cost
1) Facility Operating Costs	$5,500
2) Programmatic Operating Expense Directly Related to the Facility (Annual)	400
3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	25
4) GPP or Other Construction Related to the Programmatic Effort in the Facility	25
5) Other costs	0
Total other related annual costs	$5,950

13. Narrative Explanation of Total Project Funding and Other Related Requirements:

A. Total project costs
- 1) Total Facility Costs
  - a. Construction line item - No narrative required.
  - b. PE&D - None
  - c. Expense funded equipment - None.
  - d. Inventories - None.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Fuel production facility
Savannah River, South Carolina
2. Project No. 85-D-145

13. Narrative Explanation of Total Project Funding and Other Related Requirements: (Cont'd)

2) Other project costs
   a. R&D - A total of $9,350,000 is expected to be spent for process development. Development consists of evaluating processes, experimentally verifying the chosen process, collecting baseline data, and operation of a technology transfer laboratory. Development is expected to continue into construction to verify design areas.

   b. Conceptual design - Includes conceptual design performed on Project 85-D-142.

   c. Engineering studies - Includes fabrication of full scale models, and startup assistance.

   d. Other project-related costs - A total of $1,100,000 has been spent to date for plant liaison. An additional $6,280,000 is expected to be spent for preparation of safety analysis and environmental evaluation, and for preparation of software for computer systems dedicated to security and safeguards and accountability of nuclear materials.

B. Other related annual costs
1. Facility Operating Costs - The annual operating cost is estimated to be $5,500,000 (FY-1985 $) primarily consisting of labor, utilities and raw materials.

2. Programmatic Operating Expenses Directly Related to the Facility - waste handling.

3. Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility - normal replacement costs.

4. GPP or Other Construction Related to Programmatic Effort - cost to update or improve facilities.

5. Other Costs - none.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and location of project: Safeguards and security improvements, plantwide
Savannah River, South Carolina

2. Project No.: 84-D-134

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3. Date A-E initiated: 1st Qtr. FY 1985

3a. Date physical construction starts: 1st Qtr. FY 1985

4. Date construction ends: 1st Qtr. FY 1989

5. Previous Cost Estimate: $47,800
Less amount for PE&D 0
Net cost estimate $47,800 a/
Date: 12/84

6. Current cost estimate: $52,500 b/
Less amount for PE&D 0
Net cost estimate $52,500
Date: 5/85

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7. Financial Schedule:

Fiscal Year		Authorizations	Appropriations	Obligations	Costs
1984		$12,000	$ 0	$ 0	$ 0
1985		14,900	13,450	13,450	3,068
1986		0	7,000	7,000	9,000
1986	Sequestered	0	(685)	(685)	(400)
1987		7,515	14,650	14,650	19,500
1988		14,685	14,685	14,685	16,600
1989		3,400	3,400	3,400	4,732

8. Brief Physical Description of Project

This project provides improvements to safeguards and security systems at the Savannah River Plant in the broad areas of physical security alarm systems, personnel/vehicle access controls, and Special Nuclear Materials (SNM) accountability. Subprojects will provide facilities such as the following:

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a/ Preliminary estimate based on past experience for similar installations.
b/ Based on completed conceptual design and actual cost experience.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security improvements,
plantwide
Savannah River, South Carolina

2. Project No.: 84-D-134

8. Brief Physical Description of Project (Cont'd)

A. 200-Area Physical Security Upgrades

Extensive physical security upgrades are required for the Separations Areas. Existing small Control and Alarm Centers (CAC's) will be replaced. The CAC's will include state-of-the-art alarm monitoring equipment with remotely located redundant security computers, automated closed circuit television (CCTV) surveillance systems, communications, remote personnel access control, and redundant alarm monitoring hardware. Access control hardware will be installed at selected locations throughout the areas.

B. Security Contractor Facilities

New facilities are required by the new security contractor to train and condition guard forces, maintain equipment, and to house the administrative personnel required to support their operation. Various buildings will be constructed to meet this need. A training facility, an administration facility, and a helicopter ground support facility including a hanger building will be constructed. In addition, permanent utilities will be installed at the new security force training area.

C. 300-Area Physical Security Upgrades

A new vehicle and personnel entry control facility (ECF) will be installed to control access to the Raw Materials Fuel Fabrication Facility.

D. Vehicle Barriers

Vehicle crash barriers and a reinforced motorized sliding gate will be installed at the Plutonium Fuel Fabrication Facility fence. Vehicle control barriers will be installed at various entry control points, Exclusion Area fences, and around exposed equipment.

E. Material Control and Accountability (MC&A) Improvements

Improvements to the MC&A systems will be installed in the F Separations Area.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Safeguards and security improvements, plantwide Savannah River, South Carolina	2. Project No.: 84-D-134

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9. Purpose Justification of Need for, and Scope of Purpose

Existing Control and Alarm Centers (CAC's) in H&F Areas are too small for installation and operation of the required upgraded security alarm system.

The security mission at SRP has been assumed by an independent security contractor. Facilities are needed by this contractor to train and condition guard forces, maintain equipment, and house the administrative personnel required to support their operation. These facilities are required to sustain the security contractor's ability to meet all identified threats.

Safeguards material control and accountability (MC&A) systems must provide adequate protection of SNM. New equipment, facilities, and systems to improve the quality and timeliness of accountability measurements are necessary at SRP to ensure compliance with DOE orders, improve existing detection response time, and more accurately account for SNM inventories. As a result of the systems and equipment to be implemented by this project, SRP facilities will be able to retrieve accountability data by material balance area (MBA).

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Safeguards and security improvements, plantwide
Savannah River, South Carolina

2. Project No.: 84-D-134

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10. Details of Cost Estimate c/

			(Dollars in Thousands)	
Item			Item Cost	Total Cost
A. Engineering design and inspection at approximately 31% of construction costs, Item B				$10,300
B. Construction costs				33,500
1) Improvements to land including roads, walks, fences, excavation grading, landscaping, erosion, and backfill			$ 1,200	
2) Buildings			8,100	
a. WSI training facility (20,000 SF)		$ 800		
b. WSI administrative offices (20,000 SF)		900		
c. Harden storage vault, bldg. 773-A (2,000 SF)		300		
d. Entry control facility, bldg. 701-4M (3,300 SF)		1,500		
e. Helicopter ground support facility (8,000 SF)		900		
f. F Area control and alarm center (4,500 SF)		1,440		
g. Entry control facility, bldg. 701-4F (2,900 SF)		460		
h. H Area control and alarm center (4,500 SF)		1,140		
i. Entry control facility, 701-3H (4,200 SF)		660		
3) Special facilities			$21,800	
a. H&V equipment		1,000		
b. Mechanical equipment		1,700		
c. Electrical equipment		3,500		
d. Security system		9,600		
e. ADP computer systems		6,000		
o F Area ADP system	$ 3,900			
o H Area ADP system	1,300			
o FB Line accountability ADP system	500			
o Other small ADP systems	300			
4) Utilities			$ 2,400	
C. Removal costs				1,000
Subtotal				44,800
D. Contingency at approximately 14% of above cost				6,300
E. Allowance for design and construction liaison, testing, checkout, and acceptance				1,400
Total project cost				$52,500

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c/ The above estimates are based on completed conceptual design and actual cost experience.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security improvements,
plantwide
Savannah River, South Carolina

2. Project No.: 84-D-134

11. Method of Performance

Design will be performed by both the operating contractor and negotiated architect-engineer contracts. Construction and procurement will be accomplished by the operating contractors, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

A. Total project costs	Prior Years	FY 85	FY 86	FY 87	FY 88	FY 89	Total
1) Total facility costs							
a. Construction line item..............	$ 0	$ 3,068	$ 8,600	$19,500	$16,600	$ 4,732	$52,500
b. Plant engineering and design (PE&D)	0	0	0	0	0	0	0
c. Expense funded equipment............	0	0	0	0	0	0	0
d. Inventories.........................	0	0	0	0	0	0	0
e. Other plant projects................	0	0	0	0	0	0	0
Total facility costs................	$ 0	$ 3,068	$ 8,600	$19,500	$16,600	$ 4,732	$52,500
2) Other project costs							
a. R&D necessary to complete construction......................	$ 0	$ 0	$ 300	$ 0	$ 0	$ 0	$ 300
b. Conceptual design..................	0	400	0	0	0	0	400
c. Other project related costs	0	1,110	2,315	0	700	100	4,225
Total other project costs	$ 0	$ 1,510	$ 2,615	$ 0	$ 700	$ 100	$ 4,925
Total project costs (Items 1 and 2)..................	$ 0	$ 4,578	$11,215	$19,500	$17,300	$ 4,832	$57,425

B. Other related annual funding requirements (Estimated life of project - 20 years)

	Annual Cost
1) Facility operating costs..	$1,700
2) Programmatic operating expenses directly related to the facility.....................	0
3) Capital equipment not related to construction but related to the programmatic effort in the facility...	0
4) GPP or other construction related to the programmatic effort in the facility.........	0
5) Other costs..	0
Total other related annual funding requirements..............................	$1,700

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Safeguards and security improvements, plantwide
Savannah River, South Carolina

2. Project No.: 84-D-134

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project costs
  1) Total facility costs
    (a) Construction line item - No narrative required.
    (b) Plant engineering and design - None
    (c) Expense funded equipment - None
    (d) Inventories - None
    (e) Other plant projects
  2) Other project costs
    (a) R&D necessary to complete construction - Development and testing of automatic surveillance, storage, and retrieval system.
    (b) Conceptual design - Includes funds to prepare estimates.
    (c) Other project related costs - Initial training of instrument/electrical maintenance personnel, checkout of computer system installation, engineering studies, development of software by security system vendor to specialize CAC operation to specifications, and development of software by operations personnel for realtime accountability systems.
B. Other Related Funding Requirements
  1) Facility Operating Cost - Additional maintenance and cleaning personnel associated with new WSI facilities, and new security and accountability systems.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Materials Production
Atomic Energy Defense Activities

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Process facility modifications, Richland, Washington

2. Project No. 84-D-135

3. Date A-E Work Initiated: 4th Qtr. FY 1984

5. Previous Cost Estimate: $235,000 a/
Date: 12/84

3a. Date Physical Construction Starts: 1st Qtr. FY 1987

4. Date Construction Ends: 1st Qtr. FY 1993 a/

6. Current Cost Estimate: $240,000 a/
Date: 1/86

7. Financial Schedule

Fiscal Year	Authorization	Appropriations	Obligation	Costs
1984	$ 7,500	$ 7,500	$ 7,500	$ 1,015
1985	0	10,000	10,000	11,685
1986	25,000	15,000	15,000	18,000
1986 Sequestered	0	(525)	(525)	(400)
1987	34,475	35,000	35,000	27,100
1988	45,525	45,525	45,525	24,800
1989	55,000	55,000	55,000	27,300
1990	55,000	55,000	55,000	51,300
1991	17,500	17,500	17,500	45,100
1992	0	0	0	26,900
1993	0	0	0	7,200

8. Brief Physical Description of Project

This project will provide for modifications to the existing DOE-owned fuel processing facilities at the Hanford site near Richland, Washington, for improved head-end fuel dissolution capability. The Process Facility Modifications (PFM) Project will augment existing chemical processing capabilities by providing for the cladding removal and dissolution of N Reactor and Fast Flux Test Facility (FFTF) spent fuel. This dissolved fuel product subsequently will be processed in the existing chemical processing facilities to separate the plutonium and uranium and convert to oxide products.

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a/ The cost estimate increase and the delay in construction completion are due to FY 1987 funding reductions imposed by stringent budgets.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Process facility modifications,
Richland, Washington

2. Project No. 84-D-135

8. Brief Physical Description of Project (Cont'd)

The facility modifications will include a cask receipt and decontamination area capable of handling a variety of truck casks, a rail spur and rail cask car handling capability for N Reactor fuels, a water pool for fuel unloading, transfer, and N fuel storage; a remote, manipulator-operated cell complex for fuel disassembly, cladding removal, dissolution, and waste handling; and a remote canyon cell for feed processing, blending, lag storage, and offgas treatment. These areas will be supported by adjoining operating and service galleries and by areas for supporting mechanical equipment, electrical switchgear, control rooms, change rooms, offices, etc. Truck access will be provided for FFTF fuel receipt and rail access for N fuel receipt. Utilities and services will be provided either from site distribution systems (electricity, steam, water), existing process distribution systems (recovered nitric acid, uranyl nitrate hexahydrate), or by a facility dedicated system. The latter will include ventilation air supply and exhaust treatment systems, stock closed loop cooling water, compressed air, emergency power, and plant safeguards systems. Connections will be made to the existing chemical processing facilities by an underground shielded pipe encasement containing lines for feed and waste solution transfers as well as redundant spares. Additional instrumentation, pipe routings, and vessels will be installed in the existing chemical processing facility to integrate PFM into the processing complex.

The facility modifications will include a multi-level structure adjacent to the existing chemical processing facility. The pool and process areas will be heavily shielded with reinforced concrete. Other building areas including support and truck road-dirt washdown will be structural steel with either concrete panels or metal siding with insulation sheeting. The facility will be within the existing security area and will be equipped with door locks and alarms monitored from the existing guard station. Nominal lag storage for FFTF fuel assemblies and N fuel cannisters will be provided. The FFTF fuel will be mechanically disassembled to permit segregation of nonfuel-bearing components and debris for packaging and disposal. The bundles of fuel pins will be cut into segments and fed directly into the dissolver. N Reactor fuel requires no disassembly, and each element will be cut and the segments fed into the dissolver.

Within the dissolver(s), fuel is recovered from the segmented pins by an acid leaching process. The dissolver solution will be filtered and the solids dissolved to remove residual fuel. Dissolver solution and the dissolver filtrate are combined and blended with recycled solutions to provide a solution suitable for feed to the chemical processing facility. Dissolver solution storage capabilities currently existing within the chemical processing facility will be utilized and supplemented with new instrumentation, pipe routings, and equipment to integrate PFM into the chemical processing facility.

The facility's design will include the flexibility needed for fully meeting process goals. The provision for redundant piping between the existing chemical processing facilities and the PFM will permit the transfer of a variety of process streams between them.

Project activities planned for fiscal year 1987 include the continuation of definitive design and the initiation of construction activities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Process facility modifications, Richland, Washington

2. Project No. 84-D-135

9. Purpose, Justification of Need, and Scope of Project

The purpose of this facility is to provide the capability for processing N Reactor spent fuel at a reduced cost and processing and recovering plutonium from DOE-owned fuels not currently amenable to processing in the United States due to their cladding material, physical size or other technical or economical considerations. Processing the N Reactor fuel will reduce chemical usage which directly reduces the volume of wastes generated and directly affects a cost reduction in processing N Reactor fuel. Reducing the total volume of wastes generated is not only economically desirable but is also environmentally desirable. The FFTF fuel represents an available source of plutonium needed for use in meeting Defense Programs requirements. Adding the capability for cask handling, fuel disassembly, decladding, dissolution and feed preparation will provide an efficient means of obtaining this plutonium utilizing existing solvent extraction processing capability for plutonium separation and purification. N Reactor fuel processing will accomplish the dissolution of these fuels in a more cost-effective process than the currently used chemical decladding.

The PFM will include the capability for cask handling, fuel segmentation and dissolution, feed blending, feed storage, and offgas and solid waste handling. The facility will allow the recovery of DOE Defense Program origin plutonium provided in the FFTF fuel during its fabrication and newly produced plutonium from N Reactor fuels. The FFTF fuel is currently estimated to be about 300 assemblies containing a nominal 2,000 kilograms (kgs) of plutonium. By 1990, over $1,000,000,000 worth of plutonium of fuel will be available for processing. Payback of the capital and operating costs will be within the first year of operation on FFTF fuel. About 2 years of continuous plant operation on N Reactor fuel will return the incremental investment for the N Reactor fuel capability. Fuels to be processed will be DOE-owned with the recovered plutonium to be available to meet DOE Defense Program needs. The recovered FFTF plutonium is required for blending with high purity plutonium, added to other plutonium or will be processed further to meet requirements. These uses will increase the supply of weapon-grade plutonium. The N Reactor fuel plutonium will be weapon-grade consistent with current planning.

Engineering and development programs to support this project are currently under way. These programs include process development efforts to define process parameters and enhance the flow sheet and prototype mock-up activities to demonstrate viability of the equipment design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Process facility modifications, Richland, Washington

2. Project No. 84-D-135

10. Details of Cost Estimate b/

		Item Cost	Total Cost
a. Engineering, design and inspection costs at approximately 28% of construction costs, item b			$ 42,900
b. Construction Costs			153,700
1. Site improvements to land		$ 4,400	
2. Buildings		79,300	
a) Process Building, 110,000 sq. ft. @ $709/sq. ft.	$ 78,000		
b) Support Facilities, 8,000 sq. ft. @ $162/sq. ft.	1,300		
3. Utilities, HVAC		33,100	
4. Special facilities		36,900	
c. Standard Equipment (furniture)			1,000
Subtotal			$197,600
d. Contingency at approximately 21% of above costs			42,400
Total			$240,000

11. Method of Performance

Design and inspection will be performed under a negotiated A-E contract. Construction and procurement will be accomplished to the greatest extent possible by fixed-price contracts awarded on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	Total
A. Total project costs											
1. Total facility costs											
a. Construction line item	$ 12,700	$17,600	$27,100	$24,800	$27,300	$51,300	$45,100	$26,900	$ 7,200	$ 0	$240,000
b. PE&D	0	0	0	0	0	0	0	0	0	0	0
c. Inventories	0	0	0	0	0	0	0	0	0	0	0
Total facility funding	$ 12,700	$17,600	$27,100	$24,800	$27,300	$51,300	$45,100	$26,900	$ 7,200	$ 0	$240,000

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b/ Cost estimate is based on a completed conceptual design and a partially completed definitive design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Process facility modifications,
Richland, Washington

2. Project No. 84-D-135

12. Funding Schedule of Project Funding and Other Related Funding Requirements (Cont'd)

	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	Total
2. Other project costs											
a. Engineering and Development activities necessary to complete construction	$6,315	$ 4,256	$ 7,184	$ 2,965	$ 1,180	$ 890	$ 295	$ 0	$ 0	$ 0	$ 23,085
b. Conceptual design	8,063	0	0	0	0	0	0	0	0	0	8,063
c. Environmental & safety design analysis	1,386	596	584	415	440	468	319	337	71	50	4,666
d. Technical support, training, & startup	10,785	1,848	3,308	2,620	3,280	4,042	4,886	5,663	11,829	3,550	51,811
e. Capital Equipment not related to construction	35	319	1,000	1,100	2,400	2,000	453	0	0	0	7,307
f. GPP construction related to construction	68	0	0	0	0	0	0	0	0	0	68
Total other project funding	$26,652	7,019	$12,076	$ 7,100	$ 7,300	$ 7,400	$ 5,953	$ 6,000	$11,900	$3,600	$95,000
Total project funding (Items 1 & 2)	$39,352	$24,619	$39,176	$31,900	$34,600	$58,700	$51,053	$32,900	$19,100	$3,600	$335,000

B. Other related funding requirements (Estimated life of facility: 25 years)

1. Facility maintenance and operating cost	$11,000
2. Programmatic operating expenses	1,900
3. Capital equipment not related to construction	0
4. GPP or other construction related to project	$ 0
Total other related annual funding requirements	$12,900

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project funding

1. Total Facility Costs
   a. Construction Line Item - No narrative required.
   b. PE&D - None required.
   c. Inventories - None required.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Process facility modifications, Richland, Washington
2. Project No. 84-D-135

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements (Cont'd)

2. Other project costs
   a. E&D necessary to complete construction - Approximately $23,085,000 will be spent on engineering and development activities including dissolution studies, equipment mockups, and process verification testing.
   b. Conceptual Design - Approximately $8,063,000 has been spent on facility conceptual design.
   c. Environmental and Safety Analysis Report - Environmental and Safety Assessments and Analysis Reports will be prepared, appropriate in scope, to each phase of the project.
   d. Technical support, training and startup - Approximately $51,811,000 will be spent for project support during design and construction, testing, and startup of the completed facility and training of operating personnel.
   e. Capital equipment not related to construction.- Approximately $3,000,000 will be spent for the fuel transport cask design and fabrication. Also included is $4,000,000 for equipment spares and $307,000 for modifications to an existing building for use as the mechanical equipment testing and demonstration facility.
   f. GPP or other construction related to programmatic effort - Approximately $68,000 was spent on definitive design to modify an existing building for use as the mechanical equipment testing and demonstration facility. This effort is now planned to be performed in a different building which will be funded by Item e. above.

B. Total related funding requirements

1. Facility operating costs - An estimated cost of $11,000,000 annually consists primarily of labor and utilities to operate the facility.
2. Programmatic operating costs - $1,900,000 of estimated annual costs consists primarily of other functional support.
3. Capital equipment not related to construction - None
4. GPP or other construction related to Programmatic effort - None

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative materials in whole dollars.)

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1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee

2. Project No: 84-D-136

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3. Date A-E Work Initiated: 4th Qtr. FY 1984

3a. Date Physical Construction Starts: 4th Qtr. FY 1985

4. Date Construction Ends: 2nd Qtr. FY 1988

5. Previous Cost Estimate: $20,600
Date: 12/83

6. Current Cost Estimate: $20,600
Date: 12/85

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7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	4,400	1,000 [1/]	0	0
1985	8,000	4,400	5,400	2,000
1986	7,200	12,200	12,200	5,950
1987	1,000	3,000	3,000	9,000
1988	0	0	0	3,650

8. Brief Physical Description of Project

Reactivation of the existing dry chemistry facility in the Oak Ridge Y-12 Plant will require extensive refurbishment and restoration. This system is used to convert enriched uranium hexafluoride (UF_6) to uranium tetrafluoride (UF_4) by hydrogen reduction. In addition to the complete disassembly of all major components of the facility, including control instrumentation and ancillary systems for the purpose of inspection to verify functionality as well as the replacement of defective, deteriorated, and nonfunctional equipment, it will be necessary to apply modifications to the system to ensure compliance with EPA, safeguards, and safety regulations.

[1/] FY 1984 reprogramming approved in October 1984.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee
2. Project No: 84-D-136

8. Brief Physical Description of Project (cont'd)

Major items presently expected to require replacement are listed as follows: reduction reactors, product powder collection hoppers, primary and secondary filter systems, cylinder receiving scale, cylinder feed manifold, product powder take-off gloveboxes, flow control valves, differential pressure transmitters, pressure recorder/controllers, thermocouples, 3-way solenoid valves, temperature transmitters, heater controls, temperature recorders, and strip heaters in the heated housings. Items to be refurbished include: the vacuum cleaning system, the cold trap station, the fire protection sprinkler system, and all manual valves. New systems to be provided include: sound attenuation for a vibrator system, a new dock and fluoride cylinder manifold, a new connecting network to tie critical alarms to the Plant Monitoring System, a new process control console, a new system for hydrogen and fluoride monitoring, new hydrogen fluoride vent gas treatment system, an enriched uranium accountability satellite computer with associated terminal equipment for output to the existing Y-12 central accountability system, and a personnel and emergency evacuation stairwell from the mezzanine. The project scope may include, but will not be limited to, the above listed items. The remaining facilities and equipment in the dry chemistry system will be dismantled and inspected, and any subsequent replacement or refurbishment will be based upon observed condition.

A prominent feature of the modified conversion facility is the incorporation of many new and improved health and safety devices and designs to minimize uranium losses. An example of this principle is the replacement of the original UF_6 vaporizer system with two new autoclaves or leak-proof pressure vessels designed to heat the UF_6 supply cylinders by forced air convection. Other safety features have been included, such UF_6 detection devices, a capture system, and other improvements related to process control. These changes are expected to preclude the hazards and material losses resulting from ruptures and releases.

A facility for UF_6 sample withdrawal from incoming product cylinders is also included in the project. It is necessary to comply with requirements of the Department's Safeguards Order 5630.2, Control and Accountability of Nuclear Materials, Basic Principles.

9. Purpose, Justification of Need for, and Scope of Project

Renovation of this facility is required to provide a capability to increase the inventory of enriched uranium useful to the DOE's defense program activities for weapons production and production reactor operations. This facility which was previously used for this purpose needs renovation to restore physical deterioration and accommodate modern and environmental concerns. The renovation proposed here will provide conversion capabilities and capacities to satisfy the projected shortages.

There are no other facilities available within the DOE or elsewhere to provide the capability and capacity needed. Renovation of the Y-12 facilities is the most effective way to provide these necessary facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee
2. Project No: 84-D-136

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10. Details of Cost Estimate[a/]

	Item Cost	Total Cost
A. Engineering, design and inspection at about 21% of construction costs, Item B	$	$ 2,980
B. Construction Costs		14,080
(1) Buildings		
(a) Other, new buildings	1,240	
(b) Building modification and addition	1,440	
(2) Special facilities	11,400	
C. Standard Equipment		100
Subtotal		17,160
E. Contingency at approximately 20% of above costs		3,440
Total Project Cost		$20,600

11. Method of Performance

To the extent feasible, design will be on the basis of a negotiated A-E contract; however, some of the items may be more appropriate for operating contractor design. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

[a/] Based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee

2. Project No: 84-D-136

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
A. Total Project Funding						
(1) Total Facility Costs						
(a) Construction Line Item	$ 0	$2,000	$ 5,950	$ 9,000	$ 3,650	$20,600
(b) PE&D	0	0	0	0	0	0
(c) Expense Funded Equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total Facility Costs	$ 0	$2,000	$ 5,950	$ 9,000	$ 3,650	$20,600
(2) Other Project Funding						
(a) R&D Necessary to Complete Construction	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
(b) Other Project Related Costs	1,025	0	0	0	0	1,025
Total Other Project Funding	1,025	0	0	0	0	1,025
Total Project Funding	$ 1,025	$ 2,000	$ 5,950	$ 9,000	$ 3,650	$21,625

B. Total Related Funding Requirements

(1) Facility Operating Costs	$1,050
(2) Programmatic Operating Expenses Directly Related to the Facility	2,450
(3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0
(4) GPP or Other Construction Related to Programmatic Effort in the Facility	0
(5) Other Costs	0
Total Other Related Annual Funding Requirements	$3,500

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee

2. Project No: 84-D-136

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total Project Funding
  (1) Total Facility
    (a) Construction Line Item Funding
    (b) PE&D Funding not Required for Titles I and II - not applicable.
    (c) Expense Funded Equipment - not applicable.
    (d) Inventories - not applicable.
  (2) Other Project Funding
    (a) R&D Necessary to Complete - not applicable.
    (b) Other Project Related Funding - Conceptual Design Report (completed at a cost of $255,000), design criteria, project and contract management plans, and quality assurance and safety plans.

B. Total Related Funding Requirements
  (1) Facility Operating Costs - $1,050,000. Includes utilities, janitorial services, related materials and supplies and overhead. The overhead allocation is $305,000.
  (2) Programmatic Operating Expense Directly Related to the Facility - $2,450,000. Includes direct labor, fringes, production materials, supplies, and overhead. The overhead allocation is $710,000.
  (3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility to Maintain Viable Facilities - none.
  (4) GPP or Other Construction Related to Programmatic Effort to Sustain Viable Operations - none.
  (5) Other Costs - none.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho

2. Project No. 84-D-137

3. Date A-E Work Initiated: 1st Qtr. FY 1985

3a. Date Physical Construction Starts: 1st Qtr. FY 1985

4. Date Construction Ends: 3rd Qtr. FY 1987

5. Previous Cost Estimate: $10,000
Less Amount for PE&D: 0
Net Cost Estimate: $10,000
Date: 12/84

6. Current Cost Estimate: $10,000
Less Amount for PE&D: 0
Net Cost Estimate: $10,000
Date: 1/86

7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1984	$ 2,000	$ 0	$ 0	$ 0
1985	8,000	5,000	5,000	2,998
1986	0	5,000	5,000	5,200
1986 Sequestered	0	(300)	(300)	(200)
1987	0	300	300	2,002

8. Brief Physical Description of Project

This project will provide plant perimeter and internal facility security system improvements needed for compliance with recent planning guidance on special nuclear material (SNM) theft and sabotage protection. It does not duplicate currently authorized upgrade actions. The project will include items such as additional plant perimeter hardening; construction or modification and equipping of hardened entry control points; associated access of patrol roads; plant-related alarm and assessment systems; redundant capabilities for critical systems subject to single point failures; internal material access or storage area hardening; improved access control systems or critical locations; intrusion alarms, surveillance and communications equipment; hardened guard stations; and barriers or positive delay mechanisms. The project will investigate and evaluate alternative approaches to achieving the required SNM theft and/or vital facility sabotage protection measures to assure the end result satisfies current regulations/guidelines, and retains effective operational capabilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho

2. Project No. 84-D-137

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9. Purpose, Justification of Need, and Scope of Project

A long-range program to achieve an effective, balanced IFPF safeguards and security system has been in progress for several years. System improvements to date were designed to meet previously established requirements. The requested improvements are necessary for continued compliance with Department of Energy Orders pertaining to the physical protection of special nuclear materials (SNM). The resulting system must detect, and to the extent possible, prevent or deter SNM theft and sabotage related adversary actions and provide the timely warning and interpretation capabilities necessary to effectively counter all anticipated actions. Completion of this and other ongoing or planned projects, together with proposed administrative and procedural changes, should provide the capabilities required for compliance with current regulations and guidelines.

Project activities planned for Fiscal Year 1987 include the completion of design and construction activities initiated in Fiscal Year 1985.

10. Details of Cost Estimate a/

	Item Cost	Total Cost
a. Engineering, design and inspection at 21% of construction cost, item b.		$ 1,300
b. Construction cost		6,100
1. Improvements to land: fencing, roads, etc.	$2,300	
2. Building/Structures	620	
3. Special Facilities	560	
4. Utilities	2,620	
c. Standard equipment (to be designed for remote control operations)		510
d. Demolition and removals		90
Subtotal		8,000
e. Contingency at approximately 25% of above costs		2,000
Total estimated costs		$10,000

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a/ Cost estimate based on a completed conceptual design and partially completed definitive design and construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho

2. Project No. 84-D-137

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11. Method of Performance

Design will be accomplished by negotiated architect-engineer contract and construction and procurement by contracts awarded on the basis of competitive bids, except for alarm equipment which will be Government Furnished Equipment (GFE).

12. Funding Schedule of Project Funding and Other Related Funding Requirements

A. Total Project Costs	Prior Year	FY 1985	FY 1986	FY 1987	Total
1. Total Facility Costs					
(a) Construction Line Item	$ 0	$2,998	$5,000	$2,002	$10,000
(b) PE&D	0	0	0	0	0
(c) Expense Funded Equipment	0	0	0	0	0
(d) Inventories	0	2,998	5,000	2,002	10,000
2. Other Project Costs					
(a) R&D necessary to complete construction	$ 370	$ 0	$ 0	$ 0	$ 370
(b) Other project related costs	410	210	210	100	930
Total Other Projects Costs	780	$ 210	$ 210	$ 100	$ 1,300
Total Project Costs	$ 780	$3,208	$5,210	$2,102	$11,300

B. Other Related Funding Requirements

1. Facility Operating Costs	$160
2. Programmatic Operating Expenses Directly Related to the Facility	0
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0
4. GPP or Other Construction Related to Programmatic Effort in the Facility	0
5. Other Costs	0
Total Other Related Annual Funding Requirements	$160

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho
2. Project No. 84-D-137

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total Project Costs

1. Total Facility
   - a. Construction Line Item - no narrative required.
   - b. PE&D - no narrative required.
   - c. Expense Funded Equipment - no narrative required.
   - d. Inventories - no narrative required.

2. Other Project Costs
   - a. R&D Necessary to Complete - approximately $370,000 has been spent for conceptual design.
   - b. Other Project Related Costs - approximately $930,000 will be spent for project support during design and construction and for testing and startup of the completed facility

B. Other Related Funding Requirements

It is estimated the facilities will be used 25 years for their programmatic purposes.

1. Facility Operating Costs - facility operating costs amount to $30,000 annually for maintenance and approximately $130,000 annually for additional guard service.
2. Programmatic Operating Expenses Directly Related to the Facility - no narrative required.
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility - no narrative required.
4. CPP or Other Construction Related to Programmatic Effort - no narrative required.
5. Other Costs - no narrative required.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands. Narrative materials in whole dollars.)

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1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

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3. Date A-E Work Initiated: 1st Qtr. FY 1982

3a. Date Physical Construction Starts: 2nd Qtr. FY 1982

4. Date Construction Ends: 4th Qtr. FY 1989 c/

5.	Previous Cost Estimate:	$368,000
	Less Amount for PE&D:	750
	Net Cost Estimate:	$367,250
	Date: 12/84	
6.	Current Cost Estimate:	$368,000
	Less Amount for PE&D:	750
	Net Cost Estimate:	$367,250
	Date: 6/85	

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7. Financial Schedule

Fiscal Year		Authorizations	Appropriations	Obligations	Costs
1982		$126,000	$ 45,000a/	$ 45,000a/	$ 7,254
1983		8,700	89,700a/	82,232a/	30,838
1984		97,134	97,134b/	104,602	69,474
1985		68,800	72,800	72,800	101,861
1986		43,900	43,900	43,900	91,299
1986	Sequestered	0	(4,300)	(4,300)	(2,600)
1987		7,511	7,811	7,811	43,922
1988		15,205	15,205	15,205	17,543
1989		0	0	0	7,653

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a/ $2,000,000 of FY 1982 Appropriation temporarily reprogrammed to Project 81-D-143 then returned in FY 1983.
b/ $7,466,000 of FY 1984 Appropriation reprogrammed to Project 82-D-126.
c/ Reflects impact of funding stretchouts. Exclusive of Gramm-Rudman-Hollings reduction.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

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8. Brief Physical Description of Project

This project provides for upgrading facilities for the production of nuclear materials in support of the national defense programs. Physical deterioration that has accumulated as a result of the aging of DOE's production plants at Savannah River, South Carolina; Richland, Washington; Oak Ridge, Tennessee; and Fernald, Ohio will be corrected. Due to the size and diverse nature of this undertaking, work has been subdivided into five separate phases. Phase I (Project 81-D-128) was authorized in FY 1981. The following briefly describes the subprojects contained in Phases II, III, IV, and V; all of which are combined in this line item. The actual scope of work to be performed will be updated prior to the initiation of design to encompass any changes in equipment conditions or priorities.

a. Replace Obsolete Plutonium-238 Facilities, HB-Line, Savannah River, South Carolina (TEC $22,500,000; no FY 1987 BA)

This Phase II subproject, the third in a series to replace obsolete HB Line facilities, provides a new building addition for processing plutonium-238. The addition will be located on the top of canyon building 221-H and will be two stories in height and approximately 70 feet by 40 feet in size. Approximately 2300 cubic feet of new glove box cabinets will be provided to permit the radioactive materials to be worked under safe conditions. The ventilation system will be designed to maintain confinement of the materials with air flow directed from clean to progressively more contaminated compartments. Automatic fire suppression will be provided for all process room cabinets.

b. Steam and Power Production Facilities, Savannah River, South Carolina (TEC $3,000,000; no FY 1987 BA)[d/]

This Phase II subproject provides for renovation of wornout and obsolete coal handling components at Savannah River's 484-D Powerhouse. Structural, electrical, and mechanical equipment will be renovated or replaced to improve safety, reliability, and operating efficiency.

c. Reactor Fuel Handling Improvements (Part B), Savannah River, South Carolina (TEC $10,500,000; no FY 1987 BA)

This Phase II subproject completes a series of safety improvements to the handling equipment used to charge and discharge fuel and target assemblies in Savannah River's P, K, and C reactors. Modifications include: multiplexing all control functions; providing alternate power for moving the discharge machine under emergency conditions; separation of normal and emergency power cables; replacement of motor drives; and upgrading of critical components such as the emergency brake, emergency disengaging clutch and release.

[d/] FY 1987 subproject BA's have not yet been updated to reflect impacts of FY 1986 Gramm-Rudman-Hollings funding reductions.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

d. N Reactor Control Systems, Richland, Washington (TEC $5,000,000; no FY 1987 BA)

This Phase II subproject includes upgrading of the ball safety systems and horizontal control rod system for shutting down N Reactor under normal and abnormal conditions. The ball system upgrade work will include replacement of the ball drain valve operators, and replacement of the upper ball distribution system. The horizontal control rod inserts, which have become pitted from corrosion, will be replaced to forestall rod failure. In addition, the horizontal rod hydraulic power units will be replaced to improve system reliability.

e. N Reactor Coolant System Equipment and Instrumentation, Richland, Washington (TEC $13,972,000; no FY 1987 BA)

This Phase II subproject is intended to forestall the failure or malfunction of major items of equipment and instrumentation in the reactor cooling system that could force reactor shutdown. Worn or obsolete components will be replaced for increased reliability. The work will include items such as: replacement of the secondary cooling system hydraulic valve operators; replacement of a graphite cooling system heat exchanger; replacement of flow rate instrumentation, coolant monitoring instrumentation, and control valves; and upgrading of the coolant water sampling system.

f. Enriched Uranium Processing, Y-12 Plant, Oak Ridge, Tennessee (TEC $7,300,000; no FY 1987 BA)

This Phase III subproject provides for the replacement of existing equipment and facilities in Building 9206 and 9212 at the Oak Ridge Y-12 Plant which are dedicated to the processing of enriched uranium in support of DOE production reactor operations. Obsolete or wornout items such as the evaporator system, uranium-aluminum alloy recovery system, evaporator controls, drying furnaces, filtering equipment, etc. will be replaced. Accomplishment of the project will be spread over a period of four years in order to minimize disruption of production operations.

g. Production Components Replacement, Various Locations (TEC $79,700,000; no FY 1987 BA)

This multi-phase subproject provides for replacement of individual reactor and separations process components that have deteriorated due to age, wear, or the corrosive nature of the materials used in the process operations. At Richland, Washington; N Reactor piping insulation which has been steadily degrading over the past

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

years will be replaced; instrumentation and controls on the helium gas system, which provides an inert atmosphere to blanket the reactor, will be replaced with more precise units; and the reliability of the equipment annunciator system, which provides data for reactor control and operation, will be improved. At Savannah River, Separations Department components - agitators, vacuum transfer systems, acid recovery columns, dissolver tanks, and instrumentation - will be replaced together with equipment piping, valves, and electrical power distribution systems. Reactor piping and ventilation components that are nearing the end of their lifespan and are no longer repairable will also be renewed together with emergency alarm and communication equipment. Larger Phase V tasks include upgrading of reactor purification cell crane optical systems, replacement of the motor-generators that power the charge and discharge machines, and replacement of existing cation exchange columns.

h. Replace Production Support Equipment and Systems, Various Locations (TEC $76,442,000; no FY 1987 BA)

This multi-phase subproject provides for the replacement of support equipment and systems that have become technologically inadequate or that can no longer reliably perform their assigned function. Most tasks will cost less than $500,000. Work includes replacement of radiation monitoring and contamination control equipment at SR; restoration of Power Department mechanical components and instrumentation systems, SR; replacement of obsolete manipulators and laboratory equipment, SR; upgrading of the fuel fabrication facility, RL; restoration of the N Reactor backup steam supply, RL; replacement of heavy mobile equipment at SR; and other similar activities. Phase V will include new Savannah River tasks such as replacement of the critical alarm systems in the Building 773A high level caves, upgrading of facilities for coulometric determination of plutonium and uranium, and replacement of the 285 F&H process cooling water pump turbines.

i. Replacement Primary Heat Exchangers, Savannah River, South Carolina (TEC $11,400,000; no FY 1987 BA)

This Phase V subproject provides for procurement of replacement production reactor primary heat exchangers. The 36 heat exchangers now in service have reached the end of their service life and are being replaced as failures occur. Two initial replacement units were provided under Phase I of the Restoration Project; $12,000,000 is included in Phase V to procure the next increment of eight replacement units.

j. Restore Deteriorated Canyon Cells, Savannah River, South Carolina (TEC $3,100,000; no FY 1987 BA)

This Phase III subproject replaces canyon cell covers, floor surfaces, and embedden piping that have been corroded by acid vapors to the point that continued deterioration may lead to a loss of production capability.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations — 2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

k. Renovation of High Voltage Transmission System Control and Monitoring, Savannah River, South Carolina (TEC $17,000,000; no FY 1987 BA)

This Phase III subproject replaces approximately 67 miles of supervisory control cables and the existing multi-station relay control systems for Savannah River Plant's 115 KV electrical distribution network. Insulation and shielding on the existing underground cables have only limited remaining life.

l. Replace Plutonium Precipitator Cabinets, Savannah River, South Carolina (TEC $13,000,000; no FY 1987 BA)

This Phase II subproject provides replacement shielded cabinets and process equipment to precipitate and filter plutonium trifluoride from plutonium nitrate solutions. The existing cabinets and equipment are in poor condition and can no longer meet radiation protection or reliability requirements. New tanks, washing stations, and seal pots will be installed together with associated piping, instrumentation and other auxiliaries.

m. JB-Line Restoration, Part A, Savannah River, South Carolina (TEC $11,700,000; no FY 1987 BA)

This Phase II subproject provides for the repair or replacement of JB-Line plutonium processing equipment and systems that have become worn and unreliable. Items to be restored include: the oxidation furnace, holdup and filtrate neutralization cabinets, the hydraulic lift system, breathing air compressors, process piping, and the heating and ventilating system.

n. Reactivation of UF_6-UF_4 Reduction Facility, Feed Materials Production Center, Fernald, Ohio (TEC $12,113,000; no FY 1987 BA)

This Phase II subproject covers the reactivation and replacement of existing equipment at the Feed Materials Production Center which will be used to reduce uranium hexafluoride (UF_6) to uranium tetrafluoride (UF_4). The items proposed for reactivation or replacement include autoclave vaporizers, ammonia dissociators, and the refrigeration system for recovery of anhydrous hydrogen fluoride.

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

o. Uranium Target Plating Line, Savannah River, South Carolina (TEC $5,600,000; no FY 1987 BA)

This Phase III subproject will provide an automated plating line to nickel plate uranium slugs in the fuel processing area at the Savannah River Plant. The automated plating line will replace an existing line, which is no longer capable of maintaining required production levels and will be removed. The new plating line will consist of two sections, one for anodic etching and the other for nickel plating. It will be installed in space available in the existing uranium slug manufacturing building, adjacent to the present plating line.

p. Restoration of Special Materials Processing Facilities, Feed Materials Production Center, Fernald, Ohio (TEC $9,233,000; no FY 1987 BA)

This Phase III subproject provides for restoration of a furnace used to melt and cast uranium. New crucible loading and burnout stations will be installed for this furnace and the obsolete burnout stations in Plant 5 will be reconditioned. The existing vacuum pumps, controllers, voltage regulators, and mold tanks in Plant 5 will also be restored.

q. Modifications to Radiological Support Facilities, Savannah River, South Carolina (TEC $8,100,000; no FY 1987 BA)

This Phase IV subproject provides an approximately 25,000 square foot addition to the existing Radiological and Environmental Science Laboratory. About 60 percent of the building area will be devoted to laboratories and about 40% to offices and support facilities. This project is required to support the expanding programs of the Savannah River Laboratory Environmental Sciences Section (ESS) and the Savannah River Plant Health Protection Department.

r. Powerhouse Coal Handling Facilities, Savannah River, South Carolina (TEC $6,100,000; no FY 1987 BA)

This Phase IV subproject will restore the mechanical, structural, and electrical components of the P, K, H, and A Area powerhouse coal handling systems. These facilities have deteriorated from use and corrosion caused by water and coal leachate. Replacement of the moderate to severely damaged parts is required to maintain safety and reliability. Associated electrical systems must also be upgraded to comply with current dust-ignition-proof code requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

s. Production Control Facility, Savannah River, South Carolina (TEC $15,500,000; no FY 1987 BA)

This Phase III subproject provides a 34,000 square foot addition to the existing Production Control Facility, Building 772-F, to analyze highly radioactive process samples from dissolution of fuel tubes and target slugs. These analyses are used to determine the quantity of plutonium produced in the Savannah River reactors and to measure the results of succeeding chemical separations steps. Operating delays are already being experienced due to slow answers and inaccurate results. With the increased separations throughput that will occur when L Reactor is brought on-line problems will become more frequent. Further, the overall condition of the existing facility has deteriorated to a level where the risk of major long term outage due to accident or equipment failure is excessive. The addition will contain 17 laboratories, four shielded analytical cells, a control room, and necessary service facilities.

t. JB-Line Restoration, (Parts B & C), Savannah River, South Carolina (TEC $22,400,000; FY 1987 BA $5,400,000)

This Phase IV subproject upgrades and overhauls JB-Line facility equipment to restore equipment reliability to meet Pu-239 production commitments. Overhaul will consist of replacement of instrumentation and equipment with state-of-the-art design where practical, replacement of wornout equipment, regasketing of piping and upgrades of cabinet panel seal and H&V system. Overhauls on each glovebox will be performed in a manner to minimize downtime. The following are five areas of work for JB-Line restoration covered in Parts B and C:

(1) Complete duct piping upgrades.
(2) Overhaul Recovery Process Equipment.
(3) Miscellaneous Mechanical Line Upgrades.
(4) Replace Anion and Recovery Control Panels.
(5) Install new solution transfer vacuum system.

FY 1987 BA will be used to complete construction.

u. Replace Emergency Cooling Water Drain Lines, Savannah River, South Carolina[a/] (TEC $4,590,000; no FY 1987 BA)

This Phase III subproject replaces sections of the underground vitrified clay drainlines that are used to convey contaminated water from the P, C, or K reactors in event of activation of the emergency cooling system or process room spray systems. Existing drainlines have cracked and should not be subjected to prolonged pressurized operation. The new replacement lines will be reinforced concrete for increased structural integrity and will be sized for 17,500 gallons per minute of flow.

[a/] Originally listed as a "Production Components Replacement" task.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

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8. Brief Physical Description of Project (cont'd)[e/]

v. Warm Canyon Cranes, Savannah River, South Carolina (TEC $9,000,000; FY 1987 BA $2,411,000)

This Phase V subproject replaces the cranes, including all electrical and mechanical components, in the 200 F and H area warm canyons. FY 1987 BA will be used to continue construction.

9. Purpose, Justification of Need for, and Scope of Project

The Restoration Project directly supports the department's assigned mission of providing nuclear materials for national defense needs. The facilities and equipment involved are the prime source of weapon-grade materials within the United States. It is therefore necessary that excessive breakdowns be avoided and that production needs be met in a safe, effective, and efficient manner.

The majority of Nuclear Material Production's plants are now over twenty-five years old and have considerable age deterioration. Some of the equipment is obsolete and/or replacement parts are unavailable. In many cases vendors who furnished the equipment twenty-five years ago are no longer in business. Further, transitions in safety, process, and regulatory requirements over the years have caused some original facilities to become deficient with respect to the current state-of-the-art.

Due to funding restraints; line item construction, general plant projects and capital equipment appropriations have been insufficient to correct these deficiencies as they developed. Items previously considered deferable have gradually reached the point of urgency.

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e/ Subproject "W" - Central Powerhouse Control Savannah River - has been deleted from scope of work.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

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9. Purpose, Justification of Need For, and Scope of Project (cont'd)

The measures necessary to restore the production complex to a condition adequate to meet mission requirements was submitted to Congress in June 1979. Execution is being achieved through this five phase construction effort and associated operating funded activities. The final escalated cost of both activities will be approximately $460 million.

10. Details of Cost Estimate[a]

		Item Cost	Total Cost
A.	Engineering, Design and Inspection Costs at approximately 19% of construction costs, Item B		$ 36,090[b]
B.	Construction Cost		243,900
	(1) Improvements to land	$ 4,155	
	(2) Buildings	35,947	
	(3) Special Facilities	200,355	
	(4) Utilities	3,443	
C.	Removal Costs Less Salvage		3,850
D.	Equipment		24,870
	Subtotal		308,710
E.	Contingency at approximately 19% of above cost		58,540
	Total Project Cost		$367,250

11. Method of Performance

Design will be performed by both the operating contractors and negotiated architect-engineer contracts. Construction and procurement will be accomplished by the operating contractors, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

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[a] The above estimates are based on varying degrees of subproject completion, ranging from partial design to actual construction costs.

[b] Excludes $750,000 PE&D.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
A. Total project funding										
(1) Total facility costs										
(a) Construction line item	$ 0	$7,254	$30,838	$69,474	$101,861	$88,699	$43,922	$17,549	$7,653	$367,250
(b) Plant Engineering and Design (PE&D)	0	0	50	700	0	0	0	0	0	750
(c) Operating Expenses Funded Equipment	0	0	0	0	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0	0	0	0	0
Total Facility Costs	$ 0	$7,254	$30,888	$70,174	$101,861	$88,699	$43,922	$17,549	$7,653	$368,000
(2) Other project funding										
(a) Conceptual design and engineering studies	$1,985	$ 3,472	$ 665	$ 50	$ 0	$ 0	$ 0	$ 0	$ 0	$ 6,172
(b) Other project related costs.	600	10,389	15,528	$15,047	9,185	7,379	0	0	0	58,128
Total other project funding.	$2,585	$13,861	$16,193	$15,097	$ 9,185	$7,379	$ 0	$ 0	$ 0	$ 64,300
Total project funding (Item 1 & 2)	$2,585	$21,115	$47,081	$85,271	$111,046	$96,078	$43,922	$17,549	$7,653	$432,300

B. Total Related Funding Requirements (Estimated Life of Project = 20 years)

(1) Facility Operating Costs	$(615)
(2) Programmatic Operating Expenses Directly Related to the Facility	0
(3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	0
(4) GPP or other Construction Related to the Programmatic Effort in the Facility	0
(5) Other Costs	0
Total Other Related Annual Funding Requirements	$(615)

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total Project Funding
- (1) Total Facility Costs
  - (a) Construction line item - No narrative required.
  - (b) PE&D - $750,000 in FY 1983.
  - (c) Expense funded equipment - None.
- (2) Other Project Funding
  - (a) Conceptual design - No narrative required.
  - (b) Other project related costs - This item includes:
    - o $13,000,000 for decontamination and disposal of obsolete HB-Line facilities after completion of the new subprojects.
    - o $9,380,000 for liaison and startup.
    - o $5,965,000 for program management and administration.
    - o $32,800,000 for operating funded repairs and renovation.

B. Total Related Funding Requirements

This project will provide replacement or modification of existing facilities. The modified facilities are intended to be used in lieu of the facilities they replace. Expenses to operate and maintain the modified facilities will be essentially the same or less than the existing facilities. The savings shown result from reduced operating cost.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

Construction project Data Sheet
Atomic Energy Defense Activities
Materials Production

(Tabular dollars in thousands - Narrative in whole dollars)

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1. Title and location of project: Fuel Processing Facilities Upgrade
Idaho Fuels Processing Facility
INEL, Idaho[a]

2. Project No. 82-D-136

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3. Date A-E work initiated: 2nd Quarter FY1982

3a. Date physical construction starts: 4th Quarter FY1982

4. Date construction ends: 4th Quarter FY 1990[a]

5. Previous cost estimate: $46,000
Date: 12/83

6. Current cost estimate: $46,000
Less amount for PE&D: 0
Net cost estimate: $46,000
Date: 12/85

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7. Financial Schedule:

FISCAL YEAR	AUTHORIZATION	APPROPRIATIONS	OBLIGATIONS	COSTS
1982	$ 40,000	$10,500[b]	$ 10,500[b]	$ 1,053
1983	0	16,500[c]	16,500[c]	5,487
1984	6,000	18,000	18,000	7,849
1985	0	1,000	1,000	4,484
1986	0	0	0	8,500
1987	0	0	0	9,600
1988	0	0	0	6,700
1989	0	0	0	1,427
1990	0	0	0	900

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[a] This construction project data sheet has been revised to reflect minor changes in the project's scope and a delay in construction completion. Task No. 13, Liquid Effluent Disposal, is being added to the project's scope to allow the IFPF to remain in compliance with regulatory limits on discharge of radionuclides. Favorable construction contract bids and resultant cost savings to date are permitting this scope addition. Total estimated cost remains at $46,000,000 with no additional funding required.

[b] $3,500,000 of FY 1982 Appropriation of $14,000,000 temporarily reprogrammed to Project 81-D-143, L Reactor Upgrade. Funds were returned in FY 1983.

[c] Reflects a reprogramming of $1,000,000 of FY 1983 funds to Project 82-D-128, Plant Perimeter Security System Upgrade.

Construction Project Data Sheet

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1. Title and location of project: Fuel Processing Facilities Upgrade
Idaho Fuels Processing Facility
INEL, Idaho

2. Project No. 82-D-136

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8. Brief Physical Description of Project:

The Idaho Fuels Processing Facility (IFPF) supports the nation's defense by processing naval nuclear propulsion fuels and thus closes the Navy's fuel cycle while providing fuel for the DOE production reactors. The Navy has forecasted a forty-year mission for the IFPF which will increase its base processing load substantially beyond present capacity.

This project addresses certain high priority requirements identified for interim, reliable nuclear fuel processing at IFPF by providing for Title I and Title II design, Advance Procurement, Title III Inspection, and Construction of systems and facilities urgently needed for the continued safe and orderly operation of the IFPF. Specifically, the project will provide the following: (1) refurbishment of the main stack; (2) an improved solvent treatment system; (3) upgrade of the atmospheric protection system; (4) modification of the process equipment waste (PEW) system; (5) replacement of uranium salvage vessels with critically safe vessels; (6) upgrade of the existing product denitration system; (7) modification of the off-gas system; (8) upgrade of process sampling and transfer systems; (9) upgrade of various waste systems; (10) construction of glove box samplers; (11) construction of critically safe storage vessels for 2nd and 3rd cycle raffinate; (12) upgrade of liquid waste evaporator system; and (13) construction of a system to reduce radionuclide concentrations in liquid effluent discharged to the percolation pond.

Support systems (e.g., utilities, instrumentation, etc.) will be provided such that all modifications will be fully operable at construction completion. Design will consider future expansion plans and will be compatible with these plans to the greatest practicable extent and will include studies to confirm future interfaces.

9. Purpose, Justification of Need, and Scope of Project:

This project is needed to immediately correct problem areas which exist at the IFPF. Without these upgrades use of the IFPF may be jeopardized by increasing safety and reliability problems and concerns. Replacement of the existing main processing facility is under design (Project 85-D-139, Fuel Processing Restoration) which will safely and efficiently meet the long-term mission.

The existing IFPF processing facility was constructed 25 years ago and several plant systems have deteriorated through normal wear and corrosion. This deterioration decreases the safety, reliability, functional use, and efficiency of several process systems. This project is needed to preclude the following occurrences:
(1) prolonged shutdown of the IFPF due to an inadvertent criticality; (2) prolonged shutdown of the IFPF due to failure of a key equipment item; (3) accumulation of personnel radiation exposure beyond as-low-as-reasonably-

1. Title and location of project: Fuel Processing Facilities Upgrade
Idaho Fuels Processing Facility
INEL, Idaho

2. Project No. 82-D-136

9. Purpose, Justification of Need, and Scope of Project: (continued)

achievable levels (ALARA); (4) unacceptable safety risks due to previously described items (1), (2), and (3); and (5) reduced plant throughput in order to comply with environmental regulations. Loss of a key process would prevent operation of other critical IFPF processes and seriously impair the ability to process nuclear fuel. Such a shutdown would preclude recovery of valuable enriched uranium resources and the return of these resources to productive use.

Structural modifications to the stack are necessary for continued operation of the IFPF. The existing 25-year-old reinforced concrete stack at IFPF has deteriorated from acid attack and has many hairline cracks. Mortar bonding between some of the acid-proof bricks in the stack liner is missing or badly deteriorated which could allow the bricks to fall out and corrosive gases to enter the annular space between the liner and concrete support shell with subsequent attack on the concrete. Core sections removed from the stack in 1978 allowed both visual observation and structural evaluation of the damage and indicated marginal structural integrity. Therefore, emergency repairs to temporarily stabilize the stack have been made. This project provides for the structural strengthening of the existing chimney to satisfy current seismic standards as well as stabilization of the existing brick liner.

The present solvent treatment system generates unnecessarily large quantities of spent solvent and permits discharge of residual amounts of radionuclides. The improved solvent treatment system will cleanup this exhaust.

The existing off-gas system no longer operates with the margins of safety and reliability considered appropriate for IFPF missions. For example, the Process Building process off-gas systems filtration has been a significant source of personnel radiation exposure when the plant is operating. Presently, the filters become loaded and require replacement every three to five days. Filter changeout is done manually resulting in near unacceptable operating and maintenance personnel radiation exposure. The existing process off-gas system uses the Atmospheric Protection System (APS) as primary filtration. Because the APS has been used for primary protection, the APS prefilter has accumulated considerable contamination. It has no means of internal decontamination, thus, the radiation levels in the prefilter room have risen. Also, the valves, instrumentation, and other routinely used equipment are located (operable and readable) only in the prefilter room adjacent to the prefilter. Both situations result in repeated radiation exposure to operating and maintenance personnel.

The Process Equipment Waste (PEW) evaporator feed tank provides the sole source of surge capacity for the Process Equipment Waste/Cell Floor Drain (PEW/CFD) transfer system. If it were to fail, it would necessitate complete shutdown of the IFPF aqueous liquid waste system. The tank has received corrosive solutions containing

Construction Project Data Sheet

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1. Title and location of project: Fuel Processing Facilities Upgrade
Idaho Fuels Processing Facility
INEL, Idaho[a/]

2. Project No. 82-D-136

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9. Purpose, Justification of Need, and Scope of Project: (continued)

undissolved solids for more than 25 years. There is not usable personnel access, decontamination capability, inspection capability, or solids removal capability for this vessel. This has resulted in the undesirable existing conditions:

(1) The usable storage volume of the tank has been reduced by 15% due to accumulation of the undissolved solids received by the vessel.
(2) The integrity of the tank wall is unknown because the effects of the corrosive solutions to which it has been exposed are not easily determined.

The existing product denitration system has a primary system vessel which is not criticality safe by geometry. The operating reliability is poor and there have been minor accidental contaminations of working areas. In addition, the process instrumentation is old and is located adjacent to the denitration vessel in a contamination-prone area.

There are systems in which criticality safety is a concern. For example, the existing uranium salvage vessels are made criticality safe by using internal boron poison plates. These poison plates may be partially dissolved by corrosion due to chemicals used in the system. Since no practical method is available to evaluate the poison and vessel integrity on a routine basis, projections of the vessel and poison life are not available. In some of the systems the instrumentation used for process control is outmoded and subject to malfunction, thus accountability and inventory control may be compromised.

Selected process sampler systems will be replaced to provide structures, samplers and transfer systems capable of increasing radiation and contamination control and safety while obtaining and transferring samples to the analytical laboratory.

Replacement of the plant's westside service waste control equipment and piping is needed to reduce the risk of an accidental discharge of contaminated waste to the percolation pond. In addition, emergency power will be provided to the westside service waste pumps.

The WC-114 evaporator is used to concentrate decontamination solutions and other wastes which are too high in radioactivity to be processed by the PEW evaporator, and too dilute to be sent directly to the tank farm or to be calcined. The existing WC-114 evaporator is deteriorating due to corrosion, has insufficient instrumentation and is a slow, inefficient process. The upgrade would replace the existing evaporator, condenser, and associated instrumentation with a safer, more efficient, corrosion resistant evaporation system.

Construction Project Data Sheet

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1. Title and location of project:	Fuel Processing Facilities Upgrade Idaho Fuels Processing Facility INEL, Idaho	2. Project No. 82-D-136

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9. Purpose, Justification of Need, and Scope of Project: (continued)

Presently, the PEW Evaporator condensate is discharged with other service waste from the plant to a percolation pond. The present practice complies with all regulatory limits for discharge; however, radionuclide concentrations are projected to increase because of an increase in plant throughput and changes in the reactor fuel being processed. To continue to meet regulatory limits on discharge of radionuclides, features will be provided to remove the radionuclides consistent with ALARA and dispose of the treated stream by vaporization.

10. Details of Cost Estimate: [d/]	Item Cost	Total Cost
a. Engineering, design and inspection at approximately 39% of construction costs, item b		$11,700
b. Construction costs		29,700
1. Stack	4,720	
2. Solvent Treatment System	570	
3. Atmospheric Protection System	640	
4. Process Equipment Waste System	3,700	
5. Rework Cell Vessels	3,700	
6. Denitration System	2,200	
7. Vessel Off-Gas	120	
8. Remote Sampling and Transfer System	1,080	
9. Waste Systems Upgrade	1,100	
10. Glove Box Sampling and Transfer System	3,700	
11. Second and Third Cycle Raffinate Upgrade	3,300	
12. WC-114 Evaporator Upgrade	970	
13. Liquid Effluent Disposal	3,900	
Subtotal		$41,400
c. Contingency at approximately 11% of above costs		4,600
Total Project Costs		$46,000

[d/] The cost estimates are based on a composite of actual costs, competitive bids, completed definitive designs, and completed conceptual designs. Construction is approximately 40 percent complete.

Construction Project Data Sheet

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1. Title and location of project: Fuel Processing Facilities Upgrade
Idaho Fuels Processing Facility
INEL, Idaho

2. Project No. 82-D-136

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11. Method of Performance:

Design, construction and procurement will be accomplished by prime contracts and/or subcontracts awarded on the basis of competitive bidding.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

A. Total Project Funding	Prior Years	FY-1986	FY-1987	FY-1988	FY-1989	FY-1990	Total
1. Total Facility Cost							
a) Construction Line Item	$18,873	$ 8,500	$ 9,600	$ 6,700	$1,427	$900	$46,000
b) PE&D	0	0	0	0	0	0	0
c) Expense Funded Equipment	0	0	0	0	0	0	0
d) Inventories	0	0	0	0	0	0	0
Total Facility Costs	$18,873	$ 8,500	$ 9,600	$ 6,700	$1,427	$900	$46,000
2. Other Project Funding							
a) R&D necessary to complete construction	$ 4,460	$ 0	$ 0	$ 0	$ 0	$ 0	$ 4,460
b) Other Project Related Costs	4,060	640	1,000	700	400	500	7,300
Total Other Project Costs	8,520	640	1,000	700	400	500	11,760
Total Project Costs (Items 1 and 2)	$27,393	$ 9,140	$10,600	$7,400	$1,827	$1,400	$57,760

B. Other Related Funding Requirement	
1. Facility Operating Costs	$ 0*
2. Programmatic Operating Expenses Directly Related to the Facility	0*
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0*
4. GPP or Other Construction Related to Programmatic Effort in the Facility	0*
5. Other Costs	0*
Total Other Related Annual Funding Requirements	$ 0*

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* Operating costs and programmatic costs for the upgraded processing facility will not change from that presently budgeted for the existing processing facility.

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1. Title and location of project: Fuel Processing Facilities Upgrade
Idaho Fuels Processing Facility
INEL, Idaho

2. Project No. 82-D-136

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

A. Total Project Funding

1. Total Facility
    - a. Construction Line Item - No narrative required
    - b. PE&D - No narrative required
    - c. Expense Funded Equipment - No narrative required
    - d. Inventories - No narrative required

2. Other Project Funding

a. R&D necessary to complete construction. Approximately $4,460,000 has been expended on conceptual design activities.

b. Other Project Related Funding - Approximately $7,300,000 will be spent on project support and facility startup. Project Support will extend through design and construction and includes design reviews, independent checks and calculations, trade-off studies, safety analysis report preparation, vendor data reviews and procurement support.

B. Other Related Funding Requirements

No incremental change in funding is required for programmatic operation of the upgraded facility.

Defense Waste and
By-Products Management

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
DEFENSE WASTE AND BYPRODUCTS MANAGEMENT
Atomic Energy Defense Activities
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Approp.	FY 1986 Adjusted Approp. f/	FY 1987 Base f/	FY 1987 Request	Request vs Base
Defense Waste and Byproducts Mgmt. (DP)					
Operating Expenses:					
Interim Waste Oper ...	$ 239,810a/b/	$ 262,221d/	$ 262,221d/	$ 324,730	$ +62,509
Long-Term Waste Mgmt. Technology	90,400	89,773	89,773	88,820	-953
Terminal Storage	25,800	23,982	23,982	39,100	+15,118
Program Direction	1,955a/	2,370	2,370	2,400	+30
Total Operating Exp .	357,965	378,346	378,346	455,050	+76,704
Capital Equipment	33,881a/b/	33,769	33,769	37,805	+4,036
Construction	335,900c/	215,534c/e/	215,534c/e/	211,545	-3,989
Reduction From Prior Year Construction Projects	0	-9,225	-9,225	0	+9,225
Total Defense Waste and Byproducts Mgmt .	$ 727,746	$ 618,424	$ 618,424	$ 704,400	$ +85,976
Staffing Total FTE's	161	157	157	157	0
Headquarters	42	41	41	41	0
Idaho	119	116	116	116	0

Authorization: Section 1, Public Law 83-703.

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a/Reflects rescission allocation of $440,000 for Operating Expenses; $145,000 for Program Direction; and $1,740,000 for Capital Equipment pursuant to Section 2901 of the Deficit Reduction Act of 1984 (P.L. 98-369).

b/Reflects distribution of $150,000 to Interim Waste Operations Operating Expenses and $150,000 to Capital Equipment for ADP General Reduction.

c/The FY 1985 and FY 1986 amounts reflect reductions of $2,900,000, and $2,025,000, respectively, for IG audits, savings from management initiatives, and general reductions.

d/Reflects proposed appropriation transfer reduction of $300,000 for Environmental Assessment Activities to Energy Supply Research and Development Appropriation.

e/Reflects proposed appropriation transfer of $200,000 to Departmental Administration for general FTE clerical reduction.

f/Reflects $36,966,000 sequestered to comply with the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).

Department of Energy
FY 1987 Congressional Budget Request
Adjustments to FY 1986 Appropriations

	FY 1986 Confer.	General Reduction	FTE General Reduction	Gramm-Rudman-Hollings	ES&H Transfer/ Reprogramming	Subtotal	Comparability Adjustments	Adjusted Approp. Total
Defense Waste and Byproducts Management (DP)								
Operating Expenses:								
Interim Waste Operations	$ 271,000	$ -	$ -	$ -8,479	$ -300	$ 262,221	$ -	$ 262,221
Long-Term Waste Mgmt. Tech.	94,567	-	-	-4,794	-	89,773	-	89,773
Terminal Storage	25,070	-	-	-1,088	-	23,982	-	23,982
Program Direction	2,400	-		-30	-	2,370	-	2,370
Total, Operating Expenses	393,037	-	-	-14,391	-300	378,346	-	378,346
Capital Equipment	35,997	-	-	-2,228	-	33,769	-	33,769
Construction	228,881	-2,025	-200	-11,747	-	214,909	-	214,909
Subtotal, Defense Waste and Byproducts Management	657,915	-2,025	-200	-28,366	-300	627,024	-	627,024
General Reduction:								
Operating Expenses	-	-	-	-	-	-	-	-
Capital Equipment	-	-	-	-	-	-	-	-
Construction	-2,025	+2,025	-	-	-	-	-	-
Total, General Reductions	-2,025	+2,025	-	-	-	-	-	-
FTE Reduction	-200	-	+200	-	-	-	-	-
Use of Prior Year Balance (Defense Waste)								
Operating Expenses	-	-	-	-	-	-	-	-
Capital Equipment	-	-	-	-	-	-	-	-
Construction	-	-	-	-8,600	-	-8,600	-	-8,600
Total, Prior Year Bal. (Defense Waste)	-	-	-	-8,600	-	-8,600	-	-8,600
Total, Defense Waste & Byproducts Mgmt.	$ 655,690	$ 0	$ 0	$-36,966	$ -300	$ 618,424	$ -	$ 618,424
Operating Expenses	393,037	-	-	-14,391	-300	378,346	-	378,346
Capital Equipment	35,997	-	-	-2,228	-	33,769	-	33,769
Construction	226,656	-	-	-20,347	-	206,309	-	206,309

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
DEFENSE WASTE AND BYPRODUCTS MANAGEMENT
(Dollars in Thousands)

FY 1986 Adjusted Appropriation/FY 1987 Base	$ 618,424

Program increases and decreases:

Interim Waste Operations

o Escalation increase for Interim Waste Operations operating funds	+13,126
o Continue operations to stabilize and isolate old single-shell waste tanks at Hanford	+5,261
o Operate the B-Plant at Hanford to process additional waste streams from plutonium uranium extraction (PUREX) operations	+2,293
o Support grout disposal operations for liquid low-level waste (LLW) at Hanford	+2,974
o Continue efforts necessary to complete and implement the Hanford Defense Waste Environmental Impact Statement (EIS)	+976
o Support continued operations of the Stored Waste Examination Pilot Plant (SWEPP) and hot startup of the Processing Experimental Pilot Plant (PREPP) at the Idaho National Engineering Laboratory (INEL)	+3,662
o Continue waste transfer program at Savannah River (SR) to remove waste from old tanks; prepare feed for the Defense Waste Processing Facility (DWPF); and begin full-scale salt and sludge processing	+4,464
o Support preoperational DWPF vitrification activities at SR to assure facility operation on schedule	+17,000
o Support operations to remove salt from double-shell tanks to assure adequate space for storage of waste generated by increased high-level waste (HLW) production at SR	+5,600
o Begin scheduled startup of DWPF saltstone facility in FY 1988	+9,100
o Support continued base operations at Albuquerque (AL), Hanford, INEL, SR, Nevada (NV), Feed Materials Production Center (FMPC), and Oak Ridge National Laboratory (ORNL); provide for basic landlord requirements at Hanford and INEL; and support the Departmental Transportation Operations and Traffic Management Program at all sites	-3,924
o Continue ongoing disposition of defense surplus facilities at Mound, ORNL, INEL, and Hanford; complete engineering and initiate remedial actions for Grand Junction Treasure Island Facility	+1,977

Long-Term Management Technology

o Escalation increase for Long-Term Management Technology operating funds	+4,489

o Continue technology development for the long-term HLW management activities at Department of Energy (DOE) sites with reduced process development and engineering evaluations at SR	-3,796
o Continue direct support of DOE LLW disposal site operations and technology development to assure that evolving Federal and State standards and issues are satisfied	+1,544
o Continue hazardous waste technology application and technical support for Defense Program (DP) sites in order to cost-effectively comply with environmental regulations	+278
o Continue transuranic (TRU) waste program activities to provide certified wastes for emplacement in Waste Isolation Pilot Plant (WIPP), including system integration and certification of remote-handled and special case waste	+988
o Complete PREPP at INEL and continue engineering studies for TRU Waste Facilities at Hanford and Savannah River	-2,517
o Continue transportation research and development (R&D) at a minimal level to meet priority DP needs	-1,939

Terminal Storage

o Escalation increase for Terminal Storage operating funds	+1,199
o Transition the WIPP project from construction to operations	+13,919

Program Direction

o Increase in personnel costs	+30

Capital Equipment

o Escalation increase for Defense Waste and Byproducts Management (DWBM) capital equipment funds	+1,686
o Provide critical base programmatic equipment at all Interim Waste Operations sites and critical landlord equipment at Hanford and INEL; and Long-Term Waste Management Technology and Terminal Storage equipment	+2,350

Construction

o Escalation increase for DWBM general plant projects (GPP)	+1,171
o Provide critical base general plant projects to support programmatic activities at Los Alamos National Laboratory (LANL), Hanford, INEL, ORNL, SR, and Nevada Test Site (NTS); support landlord activities at Hanford and INEL; and support DWPF HLW activities under Long-Term Waste Management Technology	+421
o Support immediate GPP requirements for waste storage, processing, and decontamination facilities at FMPC	+1,490
o Initiate design and construction to upgrade the Waste Encapsulation and Storage Facility (WESF) K-3 Filter System and eliminate a potential safety and environmental hazard at Hanford (TEC $3.3M)	+500

o Initiate design and construction to upgrade the 242-A evaporator/crystallizer at Hanford to assure continued reliable operation and HLW volume reduction (TEC $12.6M)	+2,800
o Initiate design and construction of the 241-AQ tank farm, which consists of four double-shell aging (high-heat) HLW storage tanks, conversion of 107-AN tank to an aging waste tank, and design and construction of supporting facilities at Hanford to assure continued availability of HLW storage capacity (TEC $58.0M)	+2,100
o Initiate design and construction of a Steam Transfer Line at Hanford to allow steam transfer between 200-East and West Areas to meet production demands (TEC $13.5M)	+900
o Initiate design and construction of the Test Reactor Area (TRA) Liquid Radioactive Waste Cleanup project, Phase III, at Idaho Landlord, to complete the elimination of the disposal of liquid radioactive waste directly to the soil (TEC $5.5M)	+700
o Initiate design and construction of a New Burial Ground for the disposal of solid LLW at SR to assure the continued availability of burial ground space (TEC $14.5M)	+6,300
o Initiate design and construction of tank farm containment buildings which will improve worker safety and increase efficiency of tank farm operations by minimizing impacts of weather and other adverse climatological conditions on production operations at SR (TEC $17.3M)	+1,360
o Continue prior year project: B-Plant F filter at Hanford (TEC $4.0M)	+2,051
o Reprogram prior-year project to operating dollars: Design-only line item for a Central Waste Disposal Facility (CWDF) for low-level radioactive waste generated by all Oak Ridge (OR) facilities (TEC $1.0M)	-949
o Continue design and construction of a LLW Processing and Shipping System at FMPC to prepare the waste for shipment and off-site disposal at another DOE facility (TEC $17.0M)	+7,628
o Continue design and construction on upgrade of the INEL guard stations and security facilities to meet DOE security requirements (TEC $10.0M)	+5,342
o Continue prior year project: Seventh Calcined Solids Storage Facility at INEL to support continued Idaho Chemical Processing Plant (ICPP) operations (TEC $23.3M)	-12,519
o Continue prior year project: Central Warehouse at Hanford landlord, to replace an old warehouse which is beyond economical repair and represents a safety hazard (TEC $13.0M)	-3,444
o Continue design and construction of New Waste Transfer Facilities project at SR (TEC $41.0M)	+82
o Continue TRA Security System Upgrade Project at INEL (TEC $7.0M)	+547

o Continue prior year project: Waste Handling and Isolation Facilities Project at Hanford, consistent with stabilization and isolation of old single-shell tanks (TEC $34.5M)	-69
o Continue construction of DWPF at SR to immobilize HLW for disposal, leading to completion at the end of FY 1989 and "hot" operation in early FY 1990 (TEC $870.0M)	-20,400
o Reductions from prior year construction projects	+9,225
FY 1987 Budget Request	$704,400

DEPARTMENT OF ENERGY

FY 1987 CONGRESSIONAL BUDGET REQUEST

DEFENSE WASTE AND BYPRODUCTS MANAGEMENT

Program Overview

The goal of the Defense Waste and Byproducts Management (DWBM) program is to provide for safe interim storage, disposal or utilization of radioactive waste and byproducts generated primarily from nuclear materials production and naval propulsion. This requires development of technologies and facilities for the processing and final disposal of defense waste.

The program has three primary elements: Interim Waste Operations, Long-Term Waste Management Technology, and Terminal Storage. These elements provide mainly for the handling and disposal of low-level waste (LLW), the storage of transuranic (TRU) waste and high-level waste (HLW), development of technology for the long-term management of radioactive waste, and the demonstration of the safe disposal of defense TRU waste and HLW. The FY 1987 budget supports the implementation of the policies contained in the Defense Waste Management Plan (DWMP) which was prepared in response to Public Law (P.L.) 97-90 and signed by the President on June 16, 1983.

Fiscal year 1987 efforts in the Interim Waste Operations Program will continue the upgrading of waste handling, storage, and disposal operations by transferring HLW from old tanks at Savannah River (SR) and Hanford into new double-shell tanks, construction of new facilities, improvement of existing facilities, upgrading of burial ground operations, and the management of defense surplus facilities. In addition, funding is provided within the Interim Waste Operations Program to continue operation of the Stored Waste Examination Pilot Plant (SWEPP) and complete the hot check-out of the Processing Experimental Pilot Plant (PREPP), both located at Idaho (ID) to prepare stored TRU waste for shipment to the Waste Isolation Pilot Plant (WIPP). Also, the B-Plant at Hanford will continue its transition from a byproduct recovery facility to a facility to pretreat newly generated plutonium uranium extraction (PUREX) waste and stored HLW to reduce the volume which will ultimately require vitrification. Funding is also provided to prepare for operation of the Saltstone Facility and to prepare for cold checkout of the Defense Waste Processing Facility (DWPF) vitrification plant in 1988 at SR. The long-term program in FY 1987 will continue to focus on construction of the DWPF at SR, and the preparation for operation of the WIPP. Activities will also support plans at Hanford for operation of a HLW vitrification facility in the mid-1990's. The Long-Term Technology Program will also examine technology applicable to hazardous waste management operations at Defense Programs (DP) sites.

The DWPF will provide the final step in processing HLW at SR for disposal. Facility construction began in early FY 1984 and will be completed at the end of FY 1989. Hot operation of the vitrification plant is now scheduled for early FY 1990. The DWPF will immobilize the HLW in borosilicate glass for storage, transportation to, and disposal in a geologic repository. Immobilization in DWPF and disposal in a repository will ensure the long-term isolation of this waste from the environment with minimal maintenance and surveillance.

The WIPP, located near Carlsbad, New Mexico, will demonstrate the safe disposal of defense nuclear waste. The WIPP facilities will be capable of routine operations to receive, inspect, and emplace defense nuclear waste in a geologic disposal environment. This research and development (R&D) facility will be sized to handle quantities typical of defense nuclear waste inventories and anticipated generation rates. Emplacement of radioactive waste in WIPP will begin in late 1988.

Justification

	FY 1986 Adjusted Appropriation	FY 1987 Request
Operating Expenses	$ 378,346	$ 455,050
Interim Waste Operations	$ 262,221	$ 324,730

The net increase in Interim Waste Operations operating expenses of $62,509,000 includes $13,126,000 for inflation. Programmatic increases and/or decreases and inflationary increases will be described in each subsection below.

The objective of the Interim Waste Operations Program is to provide safe processing and utilization, storage or disposal of Department of Energy (DOE) radioactive waste and byproducts, to support defense nuclear materials production activities, and to implement cost-effective improvements in all of its ongoing and planned activities. The Interim Waste Operations Program is also responsible for the Department-wide transportation management program to meet the radioactive materials packaging and shipping requirements of DOE programs in accordance with national and international policies and regulations. Waste management support is necessary for nuclear material production and naval reactor activities. The program includes the operation and maintenance of HLW storage tanks, bins, and related processing and storage facilities at SR, Richland (RL), and ID; the operation and maintenance of LLW burial grounds at the Savannah River Plant (SRP), Oak Ridge National Laboratory (ORNL), Idaho National Engineering Laboratory (INEL), Hanford Reservation, Los Alamos National Laboratory (LANL), Sandia National Laboratory (SNL), and Nevada Test Site (NTS); the retrievable storage of TRU waste at various sites; the operation of TRU waste certification facilities at several sites; the operation of low-level liquid waste facilities; the operation of three filter testing facilities; and the processing of low-level gaseous effluents. Efforts are also underway to transfer HLW from old tanks at SR and Hanford into new double-shell tanks; to construct new, or improve existing, facilities; to improve burial ground operations; and to stabilize old burial ground areas to minimize the potential for radionuclide release to the environment. In addition, this program provides for the safe management and disposition of surplus radioactively contaminated DOE facilities, at several sites, that were used in support of defense programs.

Operations to process and store or dispose of radioactive waste from DOE defense and R&D programs, including necessary maintenance of facilities and environmental monitoring, must continue in order to assure the safe and environmentally acceptable conduct of DOE's mission. In addition, restoration is necessary to improve safety, to minimize releases of radioactivity to the environment, and to conduct cost-effective "landlord" operations at the Hanford Reservation and the INEL.

The Interim Waste Operations Program will also certify stored TRU waste for acceptance at the WIPP. Since 1984, many newly generated waste forms have been made certifiable for WIPP and stored separately from the backlog of noncertified waste. In 1985, procedures were developed so all routinely generated waste would be certifiable. In addition, as facilities are constructed to prepare TRU waste and HLW for permanent disposal, as described in the DWMP, those facilities will be operated under the Interim Waste Operations Program. This program will transition to a "Waste Operations Program" as more disposal facilities are completed and brought on-line. The Interim Waste Operations Program also supports site-specific technology adaptation efforts, at various facilities, which support and provide improvements to current and planned LLW disposal operations.

In FY 1987, the Interim Waste Operations Program will assume responsibility for the DWPF Saltstone Facility and for preoperational activities in the DWPF glass plant at SR. This facility will incorporate in concrete a decontaminated waste stream from the

HLW tanks for disposal as LLW. Other activities to support the startup of the DWPF vitrification plant will also be continued in FY 1987. This activity began in FY 1986 with support from the DWPF budget. These include the development of procedures, manuals, and the training of operators which must be completed prior to the cold and then hot checkout and startup activities.

	FY 1986 Adjusted Appropriation	FY 1987 Request
a. Idaho National Engineering Laboratory, Idaho	$ 46,180	$ 53,130

The net increase of $6,950,000 in operating expenses at INEL is the result of an inflationary increase of $2,309,000 and program increases of $4,641,000. The program increases consists of $3,662,000 for the PREPP and $979,000 for the Radioactive Waste Management Complex (RWMC), Waste Experimental Reduction Facility (WERF), and New Waste Calcining Facility (NWCF).

The increase of $3,662,000 in FY 1987 is necessary to support the startup of hot operations in the PREPP, which will provide full-scale processing of TRU waste into a form acceptable for emplacement in WIPP.

The requested funds are also required for the continued operation of the INEL RWMC for the receipt, handling, and routine disposal of solid LLW. This includes support for environmental monitoring and surveillance activities at the RWMC and support for remedial actions, if indicated by the monitoring and surveillance programs. Funding is also provided for the continued operation of the NWCF. The funding also supports an extensive program in hazardous waste treatment which will provide or adapt existing waste treatment facilities for various types of site-specific hazardous and mixed waste at INEL. Rock fracturing and excavation to extend the lifetime of the existing burial ground facilities will continue. Operation of the WERF for LLW volume reduction is also included. Groundwater and stack effluent monitoring will also continue in order to assure that there is no significant environmental impact from INEL DP activities.

b. Oak Ridge National Laboratory, Tennessee	$ 18,067	$ 19,900

Increased funding in FY 1987 of $1,833,000, of which $903,000 is due to inflation and the remaining $930,000 is programmatic related, will support efforts to identify and implement technically and environmentally acceptable LLW disposal options for the three Oak Ridge (OR) plants.

Starting in FY 1986, plans are being considered to redirect the DWBM interim operations program at ORNL, and to reprogram the $949,000 design only line item for the Central Waste Disposal Facility (CWDF) (86-D-173) in FY 1987. These actions are necessary to assure continued safe management of both liquid and solid radioactive waste generated at ORNL. No additional funding is requested in FY 1986 for this activity.

The need for the redirection results from recent decisions by the Department to indefinitely defer disposal of liquid waste by hydrofracture, to cancel plans as proposed in a draft Environmental Impact Statement (EIS) issued in September 1984 to develop a CWDF, and to implement new and improved radioactive waste treatment and disposal techniques at ORNL.

Cancellation of the CWDF requires that the $949,000 design only line item be converted to operating funding so that it can be used to develop improved disposal techniques for solid LLW. Some support will be provided by the LLW technology program. The strategy is to assess alternative disposal technologies to shallow-land burial and begin demonstrating the most promising alternatives in FY 1987. Full scale deployment of the preferred disposal technique is planned for the early 1990's.

In FY 1986, a Request for Proposals (RFP) will be issued to obtain disposal concepts from the nuclear industry for the Low-Level Waste Disposal Demonstration (LLWDD). Initial operation of the LLWDD will begin in FY 1987 and full scale operation is planned for the early 1990's.

The requested funds also provide for continued operation of the radioactive waste management facilities at ORNL, including the low-level liquid waste handling and storage system; the laboratory ventilation system for gaseous radioactive effluents; the burial grounds for the receipt, handling, and routine disposal of low-level solid waste; and the storage facility for transuranic solid waste. Also included are supporting activities such as process development, engineering and design studies for waste handling facilities, and support for the Integrated Data Base (the authoritative source of DOE radioactive waste characteristics, inventories, and projections).

The requested funding also continues the liquid and solid waste volume reduction initiatives begun in FY 1986 including efforts to develop cost-effective volume reduction methods and improve waste form stability at ORNL. This activity includes the operation of the electropolishing decontamination facility to decontaminate small items for reuse or disposal as sanitary waste, which might otherwise require disposal as LLW; operation of the TRU waste drum assay facility to segregate low-level and TRU contaminated waste; continuation of generator monitoring efforts to assure proper waste segregation and reduction in the rate of waste generation; and development and characterization of improved grout forms for waste disposal operations at ORNL.

In FY 1987, funding will also support confirmation studies and development of engineering assessments for remedial activities at the existing ORNL burial grounds, in order to reduce the migration of radionuclides to the offsite environment. Burial grounds 4 and 5 (and potentially 6) are suspected of being major contributors to the outfall of radionuclides to White Oak Creek (thence to White Oak Lake and the Clinch River), and contamination of White Oak Lake has been identified by the State of Tennessee as being a high priority item for remedial action. These activities are consistent with the recommendations of the February 1984, "Environmental Management Plan for the Oak Ridge Reservation" (Gore/Lloyd report), which describes proposed solutions and funding for environmental problems that exist at the three Oak Ridge plants.

The requested funding reflects implementation of the new waste management policy adopted by OR in FY 1986 that emphasizes volume reduction to conserve existing disposal capacity and use of interim storage at the Oak Ridge Gaseous Diffusion Plant (ORGDP) until a disposal option is verified for full scale implementation. Included in the new policy is a decision to defer additional hydrofracture injections, develop alternative disposal strategies for liquid radioactive waste at ORNL, and institute a backcharging system to charge waste generating programs for disposal of the waste they generate. In addition, discussions are being held with the Office of Energy Research to reach agreement on the assignment of certain waste management activities to their landlord program, consistent with such assignments at other DOE sites.

	FY 1986 Adjusted Appropriation	FY 1987 Request
c. Hanford Reservation, Washington	$ 86,199	$ 97,280

The net increase of $11,081,000 in operating expenses at the Hanford Reservation, Washington, is comprised of an inflationary increase of $4,325,000 and programmatic increases of $6,756,000, including offsetting reductions of $4,748,000 in other program areas.

Increased funding of $2,293,000 is required in FY 1987 to support operations in B-Plant to fractionate HLW into high-level and low-level components. The high-level component will be stored in new double-shell tanks pending immobilization in the Hanford Waste Vitrification Plant (HWVP) and disposal in a repository. The low-level component will be disposed of as LLW in trenches via grouting using the Transportable Grout Facility. A demonstration of the processing of neutralized current acid waste (NCAW) in B-Plant will be completed, preparatory to full-scale processing in 1988.

Increased funding of $5,261,000 will also support the continued stabilization and isolation of old single-shell tanks. In this effort, supernatant liquid and pumpable interstitial liquid waste is transferred to new double-shell tanks, leaving the crystalline salt cake and sludge (stabilization). Piping and other connections to the old tanks are then sealed to prevent inadvertent intrusion (isolation). The increased funding will support a planned increase in the number of tanks in which pumping operations will begin. The program to stabilize and isolate all 149 old single-shell tanks will be completed in 1992. This funding also supports tank farm operations to perform surveillance and maintenance of the old tanks.

Increased funding of $976,000 will also support planned efforts related to implementation of the Hanford Defense Waste Environmental Impact Statement (HDW-EIS), scheduled for completion in FY 1987. This effort includes supplemental data gathering and technology adaptation, State and public affairs and interaction, and development of a single-shell tank disposal plan. The increase is also required to support vital activities related to Hanford's compliance with Environmental Protection Agency (EPA) and Washington State hazardous waste management regulations under the Resource Conservation and Recovery Act (RCRA). Of primary importance are activities related to permitting the disposal of low-level liquid waste streams via grouting, with the Transportable Grout Facility.

The requested funding is necessary for maintenance and operation of radioactive waste management facilities at the Hanford Reservation. The principal waste management activities include supporting PUREX facility operations; the stabilization and isolation of all 149 old single-shell tanks; the surveillance and maintenance of all waste storage tanks, including 28 new double-shell tanks; operation of waste handling and evaporation facilities; operation of LLW burial grounds for the receipt, handling and disposal of solid LLW; segregation and retrievable storage of TRU solid waste, and operations to make the TRU waste certifiable for WIPP emplacement. The requested funding also supports the operation of B-Plant to begin processing NCAW. An increase of $2,974,000 in FY 1987 will also support operations to dispose of liquid LLW via grouting in trenches with the Transportable Grout Facility.

Also included are support activities such as process development, engineering studies, and conceptual design for improved waste handling practices and facilities; for surveillance of waste management facilities which are no longer in use; and for the cleanup and control of outdoor surface contaminated areas.

Contaminated soil sites, previously used for disposal of liquid waste, are being stabilized to fix radionuclides. Fiscal year 1987 funding supports completion of this program in 1994. Site waste management inventories and process spares are also provided.

	FY 1986 Adjusted Appropriation	FY 1987 Request
d. Savannah River Plant, South Carolina	$ 81,062	$ 118,410

The net increase of $37,348,000 is comprised of an inflationary increase of $4,053,000 and programmatic increases of $33,295,000, including offsetting reductions of $2,869,000 in other program areas.

Most of the increased programmatic funding supports new DWPF-related activities. An increase of $17,000,000 is for training operating personnel, preparation of operating procedures, inspection of materials and equipment, procurement of chemicals and supplies, nonradioactive testing, and record keeping in the DWPF vitrification facility. An increase of $5,600,000 is required for operations to remove salt from double-shell tanks to assure adequate space for storage of waste generated by increased nuclear materials production. The salt will be disposed of as LLW via the DWPF Saltstone Facility. An increase of $5,640,000 is required for preoperational activities to support the scheduled startup of the DWPF Saltstone Facility in FY 1988. An increase of $7,924,000 is required to maintain the waste transfer schedule for removal of waste from old single-shell and badly cracked tanks, and to assure an adequate supply of processed waste feed for the DWPF vitrification facility.

The requested funding is required to continue operation of radioactive waste management facilities at the SRP and to support activities related to future DWPF operations. The principal activities include processing and storage of HLW; surveillance and maintenance of waste tanks and supporting facilities, including operation of the Waste Management Maintenance Facility; waste tank evaluation; waste concentration to reduce waste volume and mobility; transfer of waste from old tanks to new double-shell tanks; low-level liquid effluent waste management; operation of SRP burial grounds for the receipt, handling and disposal of low-level solid waste and the retrievable storage of TRU solid waste, and operations to make the TRU waste certifiable for WIPP emplacement; and support for improved waste handling practices and solid waste volume reduction efforts, including process development, engineering studies, and conceptual design.

The DWPF-related activities include in-tank processing of HLW to prepare feed streams for DWPF; personnel training, and other activities to prepare for DWPF operations; and removal, cementation (via saltstone operations) and disposal of salt from double-shell tanks to optimize waste tank utilization. The DWPF vitrification plant will immobilize the separated high-level fraction of the waste for interim storage onsite and eventual disposal in a geologic repository. The FY 1987 preoperational activities supports the start of hot operations in FY 1990. The original activity related to vitrification operations was funded under the DWPF project in prior years. The DWPF Saltstone Facility will incorporate decontaminated salt solution in concrete for burial onsite as LLW. The FY 1987 funding supports hot operations beginning in FY 1988, which is necessary to assure adequate tank space commensurate with the expected nuclear materials production rate.

The overall schedule for the waste transfer program is maintained; namely, completion of the waste transfer program in FY 1994. Construction of waste transfer facilities on the old waste tanks will continue. Construction of in-tank precipitation facilities to decontaminate salt supernatant will be completed and full scale operation started.

	FY 1986 Adjusted Appropriation		FY 1987 Request
e. Feed Materials Production Center (FMPC), Fernald, Ohio	$	4,213	$ 5,660

About 20,000 drums of LLW have accumulated in storage at FMPC as of FY 1985. The increase in funding of $1,447,000, of which $211,000 is due to inflation and the remaining $1,236,000 programmatic related, will support processing (as necessary), packaging, transportation and offsite disposal of about 6,000 drums of this backlog. The increase also supports efforts to remove bulk radioactive contamination and hazardous materials from the nearly 8,000 tons of contaminated metal scrap now stored onsite, and from the anticipated large increase in this inventory generated from the Site Productivity Retention Program at the FMPC. After processing, the scrap will be shipped to OR for eventual sorting and size reduction.

The primary mission of the FMPC is to produce uranium billets and target elements for further fabrication and irradiation in the SR and Hanford production reactors. During routine operations, both solid and liquid LLW is generated. Through FY 1983, solid and liquid LLW was stored in open pits. This method of waste storage is no longer acceptable, and has been terminated. In FY 1984, dewatering, as necessary, and onsite storage of the waste in drums began. A decision was made to process, as necessary, all LLW generated at FMPC and transport it offsite for disposal at another DOE facility. Some of the waste can be disposed of with minimal processing, and shipment of this waste began in FY 1985. Some of the waste, requiring further processing, will be processed in temporary facilities and shipped offsite for disposal as it is processed. The bulk of the remainder will await processing in the Low-Level Waste Processing and Shipping System, a permanent facility scheduled to begin operation in FY 1988. At that point in time, all LLW routinely generated at FMPC will be disposed of offsite.

The requested funding also supports several ongoing activities related to the waste previously stored in pits and silos including development of data to support preparation of the FMPC-EIS. These activities include characterization of the waste; maintenance of storage facilities; groundwater monitoring related to the evaluation of contamination caused by leakage, if any; remedial actions, if necessary; and options studies for the final disposal of the waste.

f. Other Sites and Transportation Operations	$	6,783	$ 7,630

The increased funding of $489,000 in FY 1987 for the LANL, the NTS, and the SNL, including $229,000 for inflation, is mainly to support certification of TRU waste at LANL.

The DOE operates solid radioactive waste management facilities at the NTS, the LANL, and the SNL. The requested funding supports the receipt, processing, and disposal of LLW at these sites and the segregation and retrievable storage of transuranic solid waste at NTS and LANL; the consolidation of disposal sites at NTS; the stabilization of old burial grounds at LANL; the conduct of supporting environmental and other site-specific studies; and the development of procedures to certify that newly generated TRU waste meets the waste acceptance criteria for the WIPP. The funding will also provide modifications to facilities at LANL which will increase the capability to retrieve and certify TRU waste.

The Transportation Operations Management Program is responsible for developing and promulgating DOE packaging and shipping policies and procedures in support of the Department's operational and developmental programs. The increased funding in the Transportation Operations Management Program of $358,000 includes $110,000 due to inflation, and a programmatic increase of $248,000 to continue support of the Departmental Transportation Operations and Traffic Management Program at all sites. The requested funding provides for the following major activities: analyses and negotiation of rates; preparation of data for, and representation at, litigation and rate hearings; transportation regulations development; radioactive and other hazardous materials transportation training programs, including advanced and basic regulations compliance workshops, emergency response orientation, and traffic managers' certification program; data systems to track shipments, collect transportation management information, and to facilitate reporting requirements; the updating and development of informational materials on the DOE shipping program; and management of the explosives classification program. The Transportation Management Program will continue to take actions in FY 1987 that will effect savings of $5-$10 million annually in shipping costs Department-wide.

	FY 1986 Adjusted Appropriation	FY 1987 Request
g. Hanford Reservation, Landlord Support, Washington	$ 2,054	$ 1,700

The net decrease of $354,000 consists of an inflationary increase of $103,000 and a decrease in programmatic requirements of $457,000 reflecting the completion of the expense-funded portion of the upgrade program in FY 1986.

The Hanford landlord program supports maintenance, repair, and improvements in or replacement of general purpose facilities and systems, and equipment at the Hanford Reservation. Responsibilities include utilities, roads, railroads, transportation and other heavy equipment and related facilities. Operating funds are used for general purpose building and equipment maintenance, planning, engineering, and procurement associated with equipment replacement.

At the Hanford Reservation, many of the general support facilities and systems and some of the equipment is old and severely deteriorated. Failures are frequent and downtime is excessive. In FY 1981, an assessment was completed and an upgrade program was begun to restore operational safety, efficiency, and reliability to Hanford general purpose facilities support systems and equipment to complement the base support program at the site. The request supports completion of the upgrade program in FY 1988.

	FY 1986 Adjusted Appropriation	FY 1987 Request
h. Idaho National Engineering Laboratory, Landlord Support	$ 2,479	$ 3,100

The increase in funding of $621,000, consists of $124,000 for escalation and $497,000 for programmatic requirements, to provide additional scheduled maintenance for the most critical facilities and equipment, additional conceptual design to support the increased construction project activity, and an additional seismic monitoring station. The Idaho landlord program supports acquisition of automated data processing equipment, planning and non-programmatic conceptual design related to maintenance, repair, and replacement of general purpose site support facilities such as utilities, roads, service buildings, and site security facilities. In FY 1987, the following computer systems will be initiated at Idaho under lease to ownership arrangement: (1) Computer Aided Engineering (CAE) System, Phase II, estimated at $2,050,000; (2) the Super Computer System, estimated at $750,000, and (3) the Business Computer System Peripheral Upgrade, estimated at $315,000.

However, it should be noted that the actual costs will be shared programmatically according to a charge-back plan based upon utilization. The funding for the CAE System, Phase II, is required to continue the phased acquisition of a computer aided engineering system at INEL. The funding for the Super Computer System will provide for a vector processor with 4 million words of real memory and associated peripheral equipment necessary to meet the growing computational requirements for additional computing capacity and capability at INEL. Funding of the Business Computer System Peripheral Upgrade will provide additional peripherals and real memory, which will ensure that continued support of INEL's business computing needs are adequately met. Much of the general purpose facilities and equipment at INEL fall well below minimum Government standards with respect to both age and physical condition. The requested funding supports an improved degree of compliance with Federal requirements and supports compliance with the DOE policy on maintenance inspections. It also supports landlord-funded inspection, evaluation, and maintenance in the critical area of fire and security alarm systems.

	FY 1986 Adjusted Appropriation	FY 1987 Request
i. Decontamination and Decommissioning	$ 15,184	$ 17,920

In FY 1987, increased funds of $2,736,000, with $759,000 due to inflation, and $1,977,000 relevant to program needs, are allocated to continue 17 ongoing decommissioning projects to control or eliminate hazardous conditions and release facilities and equipment for reuse. Funds are provided to complete the National Environmental Policy Act (NEPA) process and remedial action planning for the Grand Junction Treasure Island Site. Uranium ore residues located there were generated in support of DP activities, and are a source of groundwater contamination. Funds also support characterization and alternatives assessment work for the Waste Holding Basin and the old Hydrofracture Facility waste pond at ORNL, consistent with the Department of Energy Environmental Management Plan for the Oak Ridge Reservation (Gore/Lloyd report).

This program provides for the safe management and disposition of surplus radioactively contaminated DOE facilities originally used in support of defense programs. Approximately 226 defense facilities are now inventoried under this program, including reactors, laboratories, reprocessing plants, and waste storage and disposal facilities, and support structures. All facilities that are to be decontaminated and decommissioned were used for defense activities and most (123) are located at the Hanford Site (Washington). Others are located at ORNL (Tennessee), INEL (Idaho), Mound (Ohio), Knolls Atomic Power Laboratory--Knolls Site (New York), and the New Brunswick Laboratory Site (New Jersey).

Priorities for decontamination and decommissioning will stress the recovery of valuable materials, the beneficial reuse of equipment and facilities, and the avoidance of future maintenance costs while reducing potential health impacts. Since FY 1982, facilities valued at $23.5 million were decontaminated for potential reuse, and by the end of FY 1987 additional facilities will be available for reuse. By performing the decommissioning work, future costs for surveillance and major maintenance will be reduced and facilities and equipment made available for reuse by other Federal programs.

Richland Operations Office, the lead field office for this program, has recently completed a 2-year planning effort with the issuance of the Surplus Facilities Management Program Long-Range Plan. The plan provides a total estimated cost for decommissioning all defense surplus facilities in the inventory, a schedule for performing the work, and estimates of waste volumes that will be generated. The total estimated cost for decommissioning all surplus facilities in the defense inventory approximates $700 million, and the scheduled completion date is 2005. Project schedules, costs, and waste volumes are based on projected disposition modes and optimizing funding profiles at each of the sites. The long-range planning information will be updated annually and will be based on the most current budget guidance.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Long-Term Waste Management Technology	$ 89,773	$ 88,820

The net decrease in Long-Term Waste Management Technology operating expenses of $953,000 includes inflation of $4,489,000. The programmatic increases and/or decreases and inflationary increases will be described in each subsection below.

The Long-Term Waste Management Technology Program is directed toward the long-term management of DOE radioactive wastes including an integrated transport system. The program consists of developing technologies for each waste type and assessing the associated hazards, costs, and environmental impacts in order to select and implement long-term disposition alternatives. The Long-Term Waste Management Technology Program also includes activities for hazardous chemical defense waste to respond to the increased attention at DOE sites in managing such waste in compliance with appropriate EPA regulations (RCRA/Comprehensive Environmental Response, Compensation and Liability Act [CERCLA]). In FY 1987, the program will continue to focus on construction of the DWPF at SR, conceptual design of a vitrification facility for Hanford, and engineering studies for TRU waste processing facilities.

a. High-level waste technology	$ 58,118	$ 57,228

The decrease in HLW technology is comprised of an increase of $2,906,000 for inflation and a reduction in programmatic activities of $3,796,000.

The net reduction of $890,000 in HLW technology funding requirements is primarily due to completion of major tasks during FY 1986 in the DWPF technical support effort.

The objective of this program is the long-term disposal of HLW at SR, Hanford, and ID. The FY 1987 program continues the sequential approach for HLW management with SR first and efforts at Hanford increasing to support implementation of waste disposal strategies. Activities at ID will be limited to alternative and technical feasibility studies of volume reduction technologies for future consideration.

Savannah River - This program directly supports the disposal of SR waste including liaison with the design and construction of the DWPF. Engineering studies and process and equipment demonstrations will support and verify cost-effective design for the DWPF. Standard test methods will be used to characterize waste forms and canisters in order to evaluate these properties against repository criteria and standards. Liaison will continue with the Office of Civilian Radioactive Waste Management (OCRWM) to assure close coordination with the civilian repository program. Comparisons of glass production rates for simulated and actual waste feeds have been completed. Interim requirements for the acceptance of DWPF glass will be completed for disposal in various geologic repository media. The preliminary report for large scale glass leaching studies has been completed and the final report will be issued. Standardized test methods for waste qualification testing have been initiated. In FY 1987 the HLW program efforts will provide testing to support acceptance of DWPF waste in salt, basalt, and tuff. Characterization of site specific waste package performance will be ascertained under simulated repository conditions.

Defense Waste Processing Facility - Technical support activities are required during design and construction of the DWPF to reduce project risk and minimize startup and operational problems. Integrated testing of melter feed, melter operation and melter offgas systems on small (1/10) scale but highly prototypical equipment with flow sheet quantities of halides and mercury will provide essential data for DWPF startup. Waste characterization and frit optimization efforts will continue to support upcoming operation of the DWPF. Documentation will be prepared to support startup and operating procedures. Also provided are DWPF plant liaison, design and construction checking, engineering tradeoff studies, and other High-Level Waste Technology Program efforts that support startup and operation of the DWPF Saltstone Facilities in FY 1988 and sludge vitrification in early FY 1990.

Hanford - The Hanford Defense Waste EIS to support selection of a disposal strategy for Hanford high-level and TRU wastes will be completed and a Record of Decision issued in FY 1987. Planning, process development and engineering evaluations will continue to support the permanent disposal of Hanford waste. Processes and engineered barriers for the in-place stabilization and disposal of existing waste at sites from which retrieval of the waste might not be warranted, are being developed, and their long-term performance evaluated. Engineered barriers are being designed to preclude or mitigate the consequences of, tank dome subsidence, intrusion of groundwater, radionuclide uptake by deep-rooted plants and excavation by burrowing animals. A demonstration of technology (barrier, etc.) required for the in-place stabilization and disposal of Hanford single-shell tank wastes will be performed. Operation of the tank mockup facility for supporting the in-place disposal demonstration has been initiated. Sampling and characterization of waste in the TY tank farm where the in-place disposal test is planned will be completed. During FY 1987, preparation will be made to initiate dome fill of one TY tank as a single-shell tank disposal test. General criteria for the safe and environmentally sound approach to in-place disposal for single-shell tank waste will be completed. Predictive models to simulate radionuclide transport by groundwater in the unsaturated zone will be completed for in-place disposal. To prepare double-shell tank waste for disposal in grout or glass, feed pretreatment technology will be developed to include: development of improved methods for sampling tank wastes; identification of waste for sampling and analysis; and development of analytical methods. In addition, NCAW and complexant concentrate waste pretreatment flowsheets will be developed.

Hanford Waste Vitrification Plant - Conceptual design, process development, and engineering research and development will continue in FY 1987 for an immobilization facility to prepare Hanford HLW for permanent disposal in a geologic repository. The facility is planned to be built in conjunction with the existing B-Plant. Existing technology and design data from DWPF will be used to the maximum extent practical to reduce cost and duplication of effort. Basic process requirements are similar to the SR DWPF except that an existing waste preparation facility (B-Plant) will be used instead of in-tank processing. The LLW salt fraction will be decontaminated and incorporated in grout for near surface burial. The sludge fraction and radionuclides removed from the salt will be vitrified for geological repository disposal. The architect/engineer (A/E) will be selected in FY 1986 and will complete the conceptual design and start the pre-title I design modifications in FY 1987.

Idaho - Planning and evaluation of alternatives for disposal of Idaho Chemical Processing Plant (ICPP) waste will continue in order to develop cost-effective permanent disposal options leading toward the selection of a waste management strategy for ICPP waste in FY 1992. Efforts are oriented toward completing a plan to demonstrate the technical feasibility of a selected long-term waste management strategy consistent with goals of the DWMP. Limited feasibility studies for developing immobilization forms with a high loading of ID HLW will be continued in FY 1987. Cost trade-off studies for options to reduce the volume of ID HLW for the basic disposal strategies will be reported. Risk analysis and regulatory impacts associated with disposal options for stored ID HLW calcine will be reported in FY 1986 and used, beginning in FY 1987, to identify a reference long-term disposal option.

	FY 1986 Adjusted Appropriation	FY 1987 Request
b. Transuranic waste technology	$ 11,373	$ 12,930

The net $1,557,000 increase, $569,000 due to inflation and $988,000 associated with programmatic requirements, in FY 1987 funding is required to provide certified wastes for emplacement in WIPP, including system integration and certification of remote-handled and special case waste.

Technology for permanent disposal of TRU waste, and implementation of the DWMP and DOE requirements for managing TRU waste (DOE Order 5820.2) will continue. Technology and related tasks include continued operational testing of the prototype transport system (TRUPACT) for contact-handled waste; development of a remote-handled waste transport system; system integration, modeling, and analysis; transfer of PREPP technology to other sites; development of equipment, facilities, and certification technology for the remote-handled waste disposal demonstration in WIPP; development of certification technology and facilities for special case and remote-handled waste, including start of SWEPP and PREPP enhancements; demonstration and verification of mobile Non-destructive Examination and Assay (NDE/NDA) Systems for cost-effective waste certification at small generators; continuation of reduced waste generation technology development; and continued development of buried waste and in-situ vitrification technology. These efforts will directly support the orderly implementation of the DWMP and DOE Order 5820.2.

c. TRU waste processing facilities	$ 4,411	$ 2,115

The net decrease of $2,296,000 is due to the completion of PREPP ($-2,915,000) and SWEPP ($-198,000) and offsetting increases in the waste processing facilities ($+596,000) and inflation ($+221,000).

TRU wastes at RL, SR, and OR will require processing to meet WIPP waste acceptance criteria. Cost/schedule optimization activities comparing centralized with decentralized processing facilities will determine whether an existing facility (for example, SWEPP/PREPP with modification) could be used, or if each of the three sites should process waste on site. The FY 1987 program will enable engineering evaluation of site specific facilities to be conducted, for example, the Transuranic Waste Facility (TWF) at SR and the Waste Receiving and Processing Plant (WRAP) Facility at RL.

. Low-level waste technology	$ 3,982	$ 5,725

In addition to the $199,000 inflationary increase in FY 1987, an increase of $1,544,000 is needed to continue support of LLW disposal site operations and technology application, thereby assuring that evolving Federal and State standards and issues are satisfied.

The objectives of this generically applied LLW technology program are to: (1) improve techniques for disposal by shallow-land burial including methods for accurate prediction through adequate monitoring and modeling; (2) provide supporting documentation in assuring compliance with DOE criteria for disposal by shallow-land burial: (3) develop cost-effective treatment processes to stabilize certain LLW streams and reduce volumes by generation avoidance; and (4) evaluate disposal concepts, such as greater confinement, for application at DOE sites.

The LLW program was begun in FY 1977 to improve shallow-land burial technology and now includes waste treatment, corrective measures, and alternative or greater confinement disposal techniques. A LLW classification system which provides a hazard index based on risk to man was developed to facilitate treatment, handling, and disposal. Various demonstrations of improved disposal and treatment technologies have been conducted and documented in handbooks. Supporting documentation to provide suggested technical guidelines was prepared for additional reference. A proposed methodology for threshold limits for LLW disposal, final airborne waste tasks for high temperature filter and filter monitoring, and assessment of treatment and forms for problematic wastes were completed. In FY 1986 limited field testing for shallow-land burial improvements, testing of waste source leaching mechanisms, limited development for corrective measures and treatment processes, and development of a handbook on alternative disposal technologies, development of engineered sorbent barrier for shallow-land burial, and small-scale testing of stabilization and closure of shallow-land burial sites will be completed. In FY 1987 funds will be provided for increased emphasis on demonstrating disposal site closure technology to reduce long-term active maintenance costs; development of disposal technology to improve liquid LLW disposal practices; evaluations of enhancements for problem wastes; and systems evaluation for overall performance assessment.

	FY 1986 Adjusted Appropriation	FY 1987 Request
e. Hazardous chemical defense waste technology	$ 5,280	$ 5,822

Besides an inflationary increase of $264,000 in FY 1987, the programmatic increase of $278,000 essentially continues the FY 1986 activities.

The objectives of this hazardous waste technology application program are the identification and application of existing techniques in handling hazardous waste and environmental restoration of inactive hazardous waste sites. Program elements consist of waste generation reduction, waste treatment, chemical recycle and utilization, disposal alternatives, monitoring and modeling, and environmental restoration. In FY 1986 tasks were initiated for development of hazardous waste inventory and technology data bases and technology demonstration and application emphasizing treatment processes which would eliminate waste streams or bring them into compliance with hazardous waste regulations. In FY 1987, the program will complete conceptual design and bench scale testing of treatment of nitrates, preliminary testing of acceptable monitoring techniques for organic hazardous wastes, and processes for cleanup and reclamation of waste acids.

f. Transportation research and development .	$ 6,609	$ 5,000

The decrease in FY 1987 reflects an inflationary increase of $330,000, with a corresponding program decrease of $1,939,000.

The net decrease of $1,609,000 in FY 1987 reflects the continuation of transportation research and development at a minimal level to meet priority DP needs.

The nuclear materials transportation program is responsible for the planning, design, development, and testing of integrated transport systems which meet Department-wide nuclear material transportation requirements. Transportation system, packaging, and materials development and testing is conducted to ensure that safe, efficient, and cost-effective transportation is available to support DOE operational needs. The program also provides transportation technology input to facility designs and environmental and safety analysis for DOE nuclear programs, and to Department of Transportation (DOT) and Nuclear Regulatory Commission (NRC) transport regulation development.

In FY 1987 work will continue to develop applied technology supporting the development of urgently needed DP transportation systems and equipment. The work will include benchmarking of analytical codes for use in shipping container designs, and definition of design environments.

Work will also be conducted on the effects of packaging hardness and target hardness on the consequent release of contents, if any, subsequent to impact. Work will continue at a minimal level in the support of upgrading consensus standards through ASME, ANSI, etc., the development of risk analysis and safety assessment parameters, operation and maintenance of transportation data bases and models and information services on shipments, incidents, packaging, routing, State and local legislation, etc. Other work in scale-model and full-scale testing (thermal/structural and normal/accident conditions), cost-saving designs component improvement (such as seals, tiedowns, impact limiters, containment filters, and radiation shields), and facilities/package interface standardization will also be covered.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Terminal Storage	$ 23,982	$ 39,100

In addition to an inflationary increase of $1,199,000 in FY 1987, the remaining increase of $13,919,000 in operating funds is required as the project transitions from construction to operations. As facilities and installed equipment are completed and turned over to DOE, preoperational testing, startup and checkout, training activities, and mining for the demonstration phase will begin. Baseline construction is scheduled to be completed in December 1986. Hot operations are scheduled to begin in October 1988. WIPP operations are, however, dependent on a legislative withdrawal of the federally owned site for exclusive DOE use for waste disposal. The Department of Interior is expected to submit this legislation during FY 1986.

The WIPP, located in Eddy County about 25 miles east of Carlsbad, New Mexico, will provide an R&D facility for demonstrating the safe disposal of defense TRU waste and for conducting R&D on various types of defense HLW in a stable geologic environment. The TRU waste will remain retrievable for up to 5 years, after which time a determination will be made whether it will be allowed to remain in the WIPP in perpetuity. The HLW used for experiments will be retrieved and removed from the site prior to decommissioning of the WIPP facility. Construction of permanent surface and underground facilities is proceeding on a phased basis, consistent with the evaluation of data obtained during the now completed exploratory program which was defined in the Final EIS.

The WIPP R&D program includes in-situ experiments and demonstrations to resolve technical issues about the disposal of radioactive waste in bedded salt. The R&D program is organized into three general areas; site characterization and evaluation, repository development, and waste package interactions. The tests are designed to extend the current knowledge about the interactions of materials and systems under actual environmental conditions. Data obtained from the experiments will be used to validate performance assessment techniques and models and to confirm facility designs and operations.

Program Direction	$ 2,370	$ 2,400

The increase in FY 1987 of $30,000 will provide sufficient funding to support DWBM Headquarters' personnel.

Program direction funds provide for the salaries, benefits, training, and travel expenses for 41 full-time equivalent (FTE) personnel associated with managing the DWBM program at DOE Headquarters. These employees are responsible for the administrative and technical support for program activities such as providing direction and control to the multiple DOE field installations involved in the program; interacting with other Federal agencies and State and local governments; and participating in the budget execution and formulation process including congressional authorization and appropriation hearings. The technical direction and administration of the broad and complex array of DWBM activities with a small Headquarters staff requires maximum utilization of available personnel. The technical management staff devotes primary attention to major program activities, such as: (1) the operation of radioactive waste management systems at DOE nuclear installations; (2) R&D for the long-term management of radioactive wastes; (3) support of major projects including the DWPF at Savannah River, South Carolina, and the WIPP project near Carlsbad, New Mexico; and (4) Department-wide transportation operations and traffic management including package certification.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Capital Equipment	$ 33,769	$ 37,805

Equipment funding is distributed by major program area as shown below:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Interim Waste Operations	$ 27,885	$ 31,615
Long Term Waste Management Technology ...	5,594	5,890
Terminal Storage	290	300
Total	$ 33,769	$ 37,805

The increase in FY 1987 capital equipment request of $4,036,000 is due to inflation, $1,686,000, and program needs, $2,350,000.

The increase in Interim Waste Operations funding of $3,730,000 is comprised of $1,392,000 for inflation and $2,338,000 for programmatic activities to support preoperational activities in the DWPF.

The requested Interim Waste Operations equipment funding provides essential equipment to support landlord responsibilities at ID and Hanford and to support Interim Waste Operations efforts at ID, OR, Albuquerque (AL), Hanford, Nevada (NV), Fernald, and SR.

The Interim Waste Operations Program is responsible for providing site landlord support and transportation equipment at the Hanford Reservation and at INEL. Examples of equipment necessary to support this activity are data processing equipment for centralized computer center operations; computer-aided design drafting and engineering equipment, light and heavy automotive equipment; heavy equipment such as cranes, bulldozers, scrapers, graders, and trailers; safety, laboratory, and communications equipment; and general purpose office equipment. The requested funding supports the continuation of equipment upgrades to restore the safety and reliability of badly deteriorated general support facilities and equipment in the Hanford and Idaho Landlord Programs.

The funding will provide replacement items that are important to the safety and reliability of continued waste operations at DOE sites. These equipment needs consist of items with a life span of several years for which rental or lease costs exceed the purchase price and existing deteriorated and obsolete items that require replacement. Failure of existing equipment is frequent and maintenance costs in conjunction with the attendant radiation exposure to maintenance personnel are not acceptable. In many instances, parts are no longer available and equipment replacement is more cost-effective than repair.

Capital equipment is required for surveillance of HLW tanks and for operational and maintenance activities associated with waste transfer, concentration, and solidification, and management of liquid waste streams at Hanford, OR, and SR. Equipment is also required for solid radioactive waste storage and disposal operations at all DOE sites. This includes the receipt, handling, and disposal of solid low-level radioactive waste, and the segregation and retrievable storage of TRU solid waste. Typical examples of the equipment used include: manipulators, pumps, motors, agitators, in-cell hoists, filters, leak detection equipment, handling devices, earth-moving equipment, soil moisture probes, waste evaporator parts, valves, laboratory apparatus, equipment for process development and testing, radiation monitoring instruments, and compactors and other volume reduction instruments. Equipment is also required to support decontamination and decommissioning projects, and includes radiation survey instrumentation, pumps, motors, heavy duty cutting equipment, and a conveyor system. Requirements also exist at Hanford to purchase a concrete batch plant in the 100-Areas to support decommissioning of the shut-down production reactors.

The increase of $306,000 in FY 1987 Long-Term Waste Management Technology and Terminal Storage equipment funding is almost entirely due to escalation and is required primarily to support the hazardous waste program. Long-term waste management technology major equipment requirements include: laboratory and analytical equipment for waste characterization, feed preparation, and hot cell testing; low efficiency gamma detectors and neutron generators; an equipment storage enclosure; and a mobile decontamination station. Smaller items are also required such as a pressure transmitter and calibrator, double wide glove box, specimen preparation equipment for a hot cell, and calcined waste handling and compaction equipment. In addition, equipment and instrumentation is required to develop accurate assay certification data for remote handled TRU waste, and the mobile assay system. Pilot scale acid waste detoxification and reclamation system and a process pilot plant for hazardous waste will be built. Hardware for operational tests for radioactive material shipment containment systems, leach testing, nondestructive testing, and other equipment is needed to assure operational performance of hardware for certification. Additional test equipment to perform full scale testing of new design for thermal, mechanics, and puncture environmental capabilities will be provided.

Shipments of TRU waste to WIPP will be made using the TRUPACT (Transuranic Package Transporter). Procurement activities for the TRUPACT fleet will continue in FY 1987 with capital equipment funds reprogrammed from WIPP construction funds in FY 1986. These activities include design, safety analysis and certification, limited long-lead material procurement, and preparing the assembly facility. A funding request will be made in FY 1988 to begin full procurement and assembly of TRUPACTS.

CONSTRUCTION PROJECTS OVERVIEW

		TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
87-D-171	General plant projects, Interim Waste Operations, various locations	$ N/A	$ 23,453 a/	$ 26,535
87-D-172	WESF K-3 Filter Upgrade, Richland, WA	3,300	0	500
87-D-173	242-A Evaporator/Crystallizer Upgrade, Richland, WA	12,600	0	2,800

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a/ FY 1986 GPP (86-D-171) shown for comparability purposes.

CONSTRUCTION PROJECTS OVERVIEW (cont'd)

		TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
87-D-174	241-AQ Tank Farm, Richland, WA	$ 58,000	$ 0	$ 2,100 b/
87-D-175	Steam System Rehabilitation, Phase I, Richland, WA	13,500	0	900
87-D-177	TRA Liquid Radioactive Waste Cleanup, Phase III, INEL, ID	5,500	0	700
87-D-180	Burial Ground Expansion, Savannah River, SC	14,500	0	6,300
87-D-181	Diversion Box and Pump Pit Containment Buildings, Savannah River, SC	17,300	0	1,360
86-D-172	B-Plant F-Filter, Richland, WA	4,000	949	3,000
86-D-173	Central Waste Disposal Facility, Design-Only, Oak Ridge, TN	1,000	949 c/	0
86-D-174	Low-Level Waste Processing and Shipping System, Feed Materials Production Center, Fernald, OH	17,000	2,372	10,000
86-D-175	INEL Security Upgrade, INEL, ID	10,000	1,958	7,300
85-D-157	7th Calcined Solids Storage Facility, INEL, ID	23,300	13,319	800
85-D-158	Central Warehouse Upgrade, Richland, WA	13,000	4,744	1,300 d/
85-D-159	New Waste Transfer Facilities, H-area, Savannah River, SC	41,000	8,118	8,200
85-D-160	Test Reactor Area Security System Upgrade, INEL, ID	7,000	2,203	2,750

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b/ Assumes $1,200,000 will be provided in FY 1987 through reprogramming from Project No. 82-N-104, $67,000; Project No. 82-N-107, $550,000; and Project No. 83-D-157, $583,000.

c/ Assumes this funding will be reprogrammed in FY 1987 to operating dollars for the Low-Level Waste Disposal Demonstration (LLWDD) at OR.

d/ Assumes $4,200,000 will be provided in FY 1987 through reprogramming from Project No. 83-D-157.

		TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
82-N-103	Waste Handling and Isolation Facilities, Richland, WA	34,450	2,069	2,000
81-T-105	Defense Waste Processing Facility, Savannah River, SC	870,000	155,400 e/	135,000
Reductions from prior years construction projects			-9,225	0
TOTAL CONSTRUCTION			$ 206,309	$ 211,545

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e/ Tentative allocation of $1,600,000 general reduction pending review of other projects.

		FY 1986 Adjusted Appropriation	FY 1987 Request
87-D-171	General plant projects (GPP), Interim Waste Operations, various locations	$ 23,453	$ 26,535

In addition to an inflationary increase of $1,171,000, a programmatic increase of $1,911,000 is required primarily to support the FMPC. This increase is vitally needed to meet immediate requirements for waste storage, processing and decontamination facilities. Included are facilities for storage of contaminated rubble generated by the Nuclear Materials Production program and for storage of contaminated oil, a graphite crucible incinerator which will meet current environmental standards, and an equipment decontamination facility. Refer to the GPP construction data sheet for specific examples of projects.

The funding is for various projects including construction, additions, upgrading, and replacement items that are required because of deterioration, obsolescence or increased waste storage or disposal requirements at the AL, Hanford, ID, OR, Fernald, and SR sites. They are necessary to meet critical health, safety, and environmental needs in landlord support and in waste management operational activities. Also included is funding for emergency repairs to sustain normal operations.

87-D-172	WESF K-3 Filter System Upgrade Richland, Washington	$ 0	$ 500

This project will provide for the design and construction of a new HEPA filter system which will permit the K-3 duct to be decontaminated without overloading the HEPA filter system. The filter enclosure will also be structurally upgraded to allow changeout without environmental release of radioactive contamination. The duct is highly contaminated (160-760 R/hr), and the system is incapable of handling a large radionuclide loading without environmental release if the contamination in the duct migrates to the filter system.

		FY 1986 Adjusted Appropriation	FY 1987 Request
87-D-173	242-A Evaporator/Crystallizer Upgrade, Richland, Washington	$ 0	$ 2,800

This project will provide for the design and construction of upgrades to the existing (and only) high-level liquid waste evaporator in the Hanford Waste Management Complex. The existing facility is approaching its design lifetime and operating efficiency and throughput are decreasing steadily. The upgrade will extend the life of the 242-A evaporator through the year 2000 and will double the operating efficiency. Without the planned upgrade, the evaporator efficiency is projected to drop less than 40 percent by the year 1990. Without this project, HLW volume will continue to increase, requiring additional HLW storage capacity.

87-D-174	241-AQ Tank Farm, Richland, Washington	$ 0	$ 2,100 a/

This project provides for the design and construction of four aging (high-heat) HLW storage tanks and associated piping, pumps and supporting systems, and the conversion of an existing double-shell waste storage tank to an aging waste tank. The tanks are needed to assure continued support for PUREX operations and to support B-Plant waste pretreatment operations. Current waste generation forecasts indicate that present storage capacity will be inadequate to meet these needs by the early 1990's.

87-D-175	Steam System Rehabilitation, Phase I, Richland, Washington	$ 0	$ 900

This project is the first phase of a projected two phase effort to upgrade or replace existing 40 year old power houses. Phase I includes construction of a new steam tie-line capable of transferring steam between the existing 200 East and 200 West steam generation and distribution systems.

87-D-177	Test Reactor Area (TRA) Liquid Radioactive Waste Cleanup System, Phase III, INEL, Idaho ...	$ 0	$ 700

This project will eliminate the discharge of radioactively contaminated waste water to the soil at INEL. The annual discharge contains up to 300 Curies of tritium and 50 Curies of other radionuclides. The currently-used seepage basin will be replaced by process equipment to maximize recycle, and a plastic-lined evaporation pond for the residual effluent.

87-D-180	Burial Ground Expansion, Savannah River, South Carolina ...	$ 0	$ 6,300

This project will provide an approximately 100 acre expansion to the existing burial ground to meet forcasted needs through 2008. It will include greater confinement demonstrations of grouted boreholes and an engineered trench which will provide improved containment of tritium and other radionuclides. Also included in the project is heavy equipment for earth moving and waste container handling.

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a/ Assumes $1,200,000 will be provided in FY 1987 through reprogramming from Project No. 82-N-104, $67,000; Project No. 82-N-107, $550,000; and Project No. 83-D-157, $583,000.

		FY 1986 Adjusted Appropriation	FY 1987 Request
87-D-181	Diversion Box and Pump Pit Containment Buildings, Savannah River, South Carolina ...	$ 0	$ 1,360

This project will provide enclosures over five pump pit and diversion box facilities in the HLW tank farm to allow operations to continue unaffected by weather conditions and to facilitate more efficient use of the facilities with decreased worker exposure to radiation. It is needed because of large increase in the amount of liquid waste handled.

86-D-172	B-Plant F-filter, Richland, Washington	$ 949	$ 3,000

This project will provide a sixth air filter cell (F-filter) to serve B-Plant. This filter will be an underground concrete cell equipped with prefilters, high efficiency particulate air filters, and an emergency back-up sand filter. F-filter will incorporate features which will help assure an estimated service life in excess of 15 years.

86-D-173	Central Waste Disposal Facility, Oak Ridge, Tennessee	$ 949 [a]	$ 0

This project provides for the design of a disposal facility for solid low-level radioactive waste generated by all three plants on the Oak Ridge Reservation. The facility will be designed to replace existing individual plant disposal facilities, all of which will be exhausted or closed by FY 1990.

Starting in FY 1986, plans are being considered to redirect the DWBM's interim operations at ORNL and to reprogram the $949,000 design only line item for the CWDF in FY 1987. The need for this redirection results from recent decisions by the Department to indefinitely defer disposal of liquid waste by hydrofracture, to cancel plans as proposed in a draft EIS issued in September 1984 to develop a CDWF and to implement new and improved radioactive waste treatment and disposal techniques at ORNL. Cancellation of the CWDF requires that the $949,000 design only line item be converted to operating funds so that it can be used to develop improved disposal techniques for solid LLW.

86-D-174	Low-level Waste Processing and Shipping System, Feed Materials Production Center, Fernald, Ohio .	$ 2,372	$ 10,000

This project will provide facilities to process liquid and solid LLW into a stable form for offsite disposal at another DOE facility. The system includes filters, waste conveyors, dryers, crushers, mills, packaging and shipping facilities, and associated decontamination, surveillance and pollution control systems.

86-D-175	INEL Security Upgrade, INEL, Idaho	$ 1,958	$ 7,300

This project provides for design, procurement, and construction to upgrade guard stations at separate locations of the INEL to meet DOE security requirements. The facility upgrades will include a main guard station, access control stations, a new security administration building, and a Special Response Team (SRT) Headquarters facility.

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[a] Assumes this funding will be reprogrammed in FY 1987 to operating dollars for the LLWDD.

	FY 1986 Adjusted Appropriation	FY 1987 Request
85-D-157 Seventh Calcined Solids Storage Facility, INEL, Idaho	$ 13,319	$ 800

This project provides for the design and construction of a storage facility for 65,000 cubic feet of granular HLW solids (calcine) produced by the NWCF, located at the ICPP. The NWCF processes the liquid HLW, generated primarily from reprocessing spent naval reactor fuels, into a form suitable for extended storage.

85-D-158 Central Warehouse Upgrade, Richland, Washington	$ 4,744	$ 1,300 a/

This project replaces the current dilapidated warehouse, built in the early 1950's, with a new facility which will provide 133,000 square feet of warehouse space and 22,000 square feet of office space. In addition, a separate building of 5,000 square feet will be built for storage of flammable materials and liquids.

85-D-159 New Waste Transfer Facilities, Savannah River, South Carolina ...	$ 8,118	$ 8,200

This project will replace the existing deteriorated H-Area Diversion Box #2 transfer facility with one of current design. The new facility, which is designed to transfer waste between the east and west H-Area tank farms, and between F- and H-Areas, will have the capability to expand to meet future needs, including accommodating DWPF feed and recycle streams.

85-D-160 Test Reactor Area (TRA) Security System Upgrade, INEL, Idaho	$ 2,203	$ 2,750

This project will enhance the intrusion and sabotage prevention at the TRA, located at the INEL, and will increase the physical protection of the Advanced Test Reactor (ATR) plant. State-of-the-art detection and intrusion control systems will be utilized, and equipment and methodology resulting from ongoing DOE research programs will be incorporated into the design of four subprojects whose completion will accomplish the goals set forth in the TRA Security Plan.

82-N-103 Waste handling and isolation facilities, Richland, Washington .	$ 2,069	$ 2,000

This project provides capital funds for the isolation of old single-shell tanks and related structures (e.g., sealing of tank openings); surveillance instrumentation for monitoring waste storage tanks; upgrading of the cathodic protection system to protect buried piping against corrosion; improvements in the centralized Computerized Automatic Surveillance System for the waste tanks; and construction of a Transportable Grout Facility to process low-level liquid waste streams for disposal. These streams are currently routed to double-shell tanks for storage.

81-T-105 Defense waste processing facility (DWPF), Savannah River, South Carolina	$ 155,400	$ 135,000

This project will provide a facility for solidifying the high-level radioactive waste at the SRP for temporary storage on site, and for transportation to, and disposal in a

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a/ Assumes $4,200,000 will be provided through reprogramming from Project No. 83-D-157 in FY 1987.

geologic repository. This facility will immobilize the HLW in borosilicate glass in steel canisters. The canisters will be stored on the SRP site in air-cooled vaults until a geologic repository is available. The project will also provide for the solidification of the decontaminated portion of the liquid and salt waste for disposal on site as a low-level radioactive waste (saltstone). Opportunities to recover useful byproducts will be considered and implemented where practical. Operation of the DWPF saltstone facilities will begin in FY 1988 and sludge vitrification will begin in early FY 1990. The DWPF will process the backlog waste inventory over approximately 10-15 years.

Fiscal year 1987 construction activities will focus on completion of major structual facilities, to about 85 percent complete for the total project. Design will continue to about 98 percent complete. Major equipment installation will continue into FY 1988. The FY 1987 funding level is necessary to maintain a project schedule for hot operations in early FY 1990 and to maintain the total estimated cost.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars).

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

3. Date A-E work initiated: 1st Quarter FY 1987

3a. Date physical construction starts: 1st Quarter FY 1987

4. Date construction ends: 4th Quarter FY 1989

5. Previous cost estimate: N/A
Date:

6. Current cost estimate: $26,535
Date: 12/85

7. Financial Schedule (prior year projects shown for comparative purposes):

		COSTS			
Fiscal Year	Obligations	FY 1985	FY 1986	FY 1987	After FY 1987
Prior Years	$ -3	$ 16,223	$ 5,213	$ 0	$ 0
1985	23,645	5,094	7,215	8,215	3,121
1986	23,453	0	14,659	4,937	3,857
sequestered 1966	(998)	0	(438)	(560)	0
1987	26,535	0	0	12,911	13,624

8. Brief Physical Description of Project:

These projects provide various items of new construction, additions, alterations, and improvements to the lands, buildings and utility systems at the Albuquerque, Nevada, Richland, Idaho, Oak Ridge, Savannah River, and Fernald offices to support waste management program needs in health, safety, environment, general support, and other program requirements. Some of the projects may be located on non-government land.

These projects also provide for various items of new construction, additions, and alterations to the land, buildings, and utility systems at Savannah River in support of the Long-Term Waste Management program. This includes the cost of installation which is an integral part of general plant projects.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification and Need for, and Scope of Project:

The estimate is based on the requirements of the various operating offices cited below:

INTERIM WASTE OPERATIONS	
Albuquerque-Los Alamos National Laboratory	$ 970
Nevada Test Site	220
Richland	5,310
Idaho	2,650
Oak Ridge National Laboratory	3,150
Savannah River	2,760
Feed Materials Production Center (FMPC)	1,490
Richland-Landlord	3,690
Idaho-Landlord	5,560
Subtotal Interim Waste Operations	$25,800
LONG-TERM WASTE MANAGEMENT TECHNOLOGY	
Savannah River	$ 735
Total Defense Waste and Byproducts Management	$26,535

Examples of subprojects under consideration are given below with preliminary cost estimates. A continuing study of requirements may result in changes, additions, or postponements.

ALBUQUERQUE-LOS ALAMOS NATIONAL LABORATORY-INTERIM WASTE OPERATIONS.............................. $ 970

NDE/A Transportation Facility $ 970

This project will provide for direct certification of stored waste, screening of stored combustible waste before incineration and transportation of newly-generated wastes. This warehouse-type structure of about 6,400 square feet will have a high bay area for temporary waste storage, and for real-time x-ray radiography and waste assay equipment. The building will also include restroom facilities, a small office, electronics shop and utility and electrical equipment rooms. The transportation portions will include a drive through vehicle loading bay, and an additional storage/staging area for WIPP-certified waste containers.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plant projects, interim waste operations and long-term management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

NEVADA TEST SITE-INTERIM WASTE OPERATIONS.. $ 220

Underground Water Line $ 220

This project will improve the service water (fire, drinking, decontamination and toilets) requirements at Area 5 of the PWMS at the NTS. This project consists of a pumphouse, a 6-inch diameter pipeline 5 miles long and a 50,000 gallon water tank. Water will be distributed from the pumphouse at the storage tank to buildings 5-6 and 5-7. The pipeline will be underground to avoid freezing.

RICHLAND-HANFORD SITE-INTERIM WASTE OPERATIONS .... $ 5,310

Capital Work Orders $ 360

These are miscellaneous projects of a capital nature, which are necessary to maintain continuity of operation, protection of the environment, and to provide safeguards for the protection of life and property. Such jobs would include additions, improvements, replacements of structures, building services, utilities, and associated equipment.

200 East Contingency Pond $ 950

This project will provide a 15 acre seepage pond near the northeast corner of 200 East Area and install a culvert tie into waste water line to 216-A-25.

242-S Evaporator Pond $ 700

This project will provide a new disposal facility for 242-S evaporator effluents.

B-Plant Canyon Crane Mechanical Upgrade $ 900

This project will upgrade the mechanical structure and subsystems of the existing B-Plant Canyon Crane to extend its useful life and enhance its operability and maintainability.

B-Plant Canyon Rail Replacement $ 900

This project will remove and replace the B-Plant canyon bridge crane support rails. This modification will ensure crane mobility for the extended operations planned in B-Plant.

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

AW Farm Exhauster Ammonium Nitrate Removal $ 250

This project will provide upgrades to AW Tank Farm Exhauster to remove ammonium nitrate from the effluents. Currently, ammonium nitrate is forming on the plenum areas downstream of the high-efficiency particulate air (HEPA) filters.

Tank 105-A Exhauster Upgrade $ 500

This upgrade will include installation of existing exhauster on a permanent concrete pad, with permanent power supply and condensate drains. A flushable de-entrainer with replaceable pads will be required for nitrate removal, and with a permanent connection for the temporary use of a portable exhauster during filter changes. Modification to existing tank ventilation lines will also be required.

B-Plant Cooling & Sanitary Water Supply Upgrade $ 750

This project will replace or upgrade elements of the current B-Plant cooling and sanitary water systems to extend their useful lives for the currently projected operating life of the facility.

IDAHO NATIONAL ENGINEERING LABORATORY-INTERIM WASTE OPERATIONS............................... $ 2,650

Service Waste Diversion System Single Failure Upgrade $ 500

Prior to January 1984, the ICPP service waste, which is ICPP's process water not coming into direct contact with radionuclides, went to an injection well. Now the service waste goes to a percolation pond to satisfy State and Federal requirements. In the event of an emergency or failure of the Service Waste System, a diversion system automatically diverts the delivery of the service waste from the percolation pond to the injection well. However, several types of single mode failures in the system can cause a diversion of service waste to the injection well, which is undesirable. This project will install redundant equipment, new instrumentation, etc., that are necessary to eliminate all the probable single failures causing unintended use of the injection well.

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

Major Equipment Decon Facility	$ 400

This project provides for decontamination of major items of equipment such as trucks, earth moving equipment, etc., that become radioactively contaminated during earth moving activities inside the ICPP. There presently are no facilities at ICPP to handle decontamination of such large equipment. Decontaminating equipment outdoors and allowing decontamination solutions to enter the environment is an unacceptable practice. This project will provide a facility to safely handle the decontamination of this large equipment.

Upgrade Spectrochemistry Laboratories	$ 600

The spectrochemistry labs are presently located on the main and second floors of the Analytical Laboratory Building. All of the heating and ventilating equipment is located on the second floor of the building. Vibrations from the operating equipment are transmitted through the building's structure and seriously affect the precision and accuracy of the laboratory instruments. Also, the labs are lacking a good controlled atmosphere resulting in contaminated samples due to chemicals and dust in the air. To alleviate many problems, these labs will be located in the basement of the Analytical Laboratory Building. The floor is quite stable and offers adequate floor space. Ventilation equipment will be installed as required.

The benefits of this project will be an increase in sample throughput, improvement in precision and accuracy, and reduction in external contaminants.

Toxic Waste Holdup System for Pilot Plants	$ 600

Chemical wastes containing hazardous materials are currently mixed with radioactive wastes and then processed through the existing ICPP process equipment waste system or sent directly to the existing high-level liquid waste tanks. This present practice does not conform to the National Waste Management Act of 1982 and other DOE directives which require that the mixing of radiological and non-radiological wastes be minimized.

To alleviate this situation, tankage and piping shall be provided to create a separate non-radiological storage system capable of handling hazardous liquid wastes. These wastes shall then be disposed of at approved storage locations.

Miscellaneous Minor GPP-ICPP	$ 240

Each year small, miscellaneous, but very important, minor GPP's are identified during the middle of the fiscal year. These are projects which require immediate attention. With all of the GPP funds previously committed, there are not funds remaining for such projects. This project will make funds available for implementing these small GPP's. The funding limit

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

for each project is $25,000. Individual descriptions for these projects will be written as they are identified. Typical examples of minor GPP's are evacuation alarms, fire alarms, process cell hatches, ceiling replacements, waste line installations, and small storage facilities.

Stored Waste Examination Pilot Plant (SWEPP) Paint Room Upgrade

$ 100

The outside surfaces of waste containers to be examined in SWEPP were originally thought to be in good physical condition, requiring only touch-up painting before shipment to the Waste Isolation Pilot Plant (WIPP). However, based on the physical condition of the drums retrieved to date, it is apparent that a large number of the storage waste drums will require complete repainting. This project upgrades the existing painting room of the SWEPP building from a "brush-only" to general spray painting capability.

Paved Accesses to SWEPP and TSA (Transuranic Storage Area) Pads

$ 60

Presently, the only paved access to the SWEPP building is via the north airlock; no paved access is available to the sides of TSA storage pads. Paving is needed in these areas to facilitate the movement, particularly in wet soil conditions, of semi-trucks/trailers and other heavy vehicles involved in waste retrieval and transportation. This project provides the required accesses.

Certified and Sorted (C&S) Building North Airlock

$ 150

The planned C&S Building North Airlock consists of an access tunnel, two electric motor operated overhead doors, and other appurtenances large enough to accommodate a tractor-trailer with a Transuranic Waste Storage Container (TRUPACT) on the trailer. The north airlock will be primarily used for loading TRUPACTS for shipment to the WIPP or the Process Experimental Pilot Plant (PREPP). It is estimated that at least 100 TRUPACTS will be processed each year.

OAK RIDGE NATIONAL LABORATORY-INTERIM WASTE OPERATIONS.. $ 3,150

LLW Line Replacement, Building 3038

$ 950

The purpose of this project is to provide several hundred feet of double-contained stainless steel piping, a valve pit, valves, and monitoring system in order to restore LLW service to Building 3038, which is used for isotope production. The new waste line will transport liquid LLW from Building 3038 to tank WC-10, and will replace piping which was abandoned because it leaked.

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

Rinse Recycle, PWTP $ 950

This project consists of collection tanks, piping, valves, and pumps for collecting and recycling the rinse water for volume reduction prior to evaporation and disposal in the LLW System. Significant amounts of nitrates in excess of State regulations are released into White Oak Creek from the Process Waste Treatment Plant (PWTP) operations. Disposal of the rinse water in the LLW system will bring the PWTP into compliance with the NPDES permit for nitrates.

Waste Transfer Line Replacement, Melton Valley $ 800

This project will provide for installation of approximately 6,300 feet of replacement PVC pipe to transfer process waste from Melton Valley to the PWTP in Bethel Valley. The existing transfer piping is approaching its design life and has required repairs because a portion was leaking. The replacement piping will provide an upgraded transfer system for liquid LLW which requires treatment to remove small amounts of radioactivity.

Monitoring Wells, Bethel Valley $ 450

This project provides for the installation of several permanent groundwater sampling wells in Bethel Valley to meet RCRA requirements. The system of wells will measure hydrostatic head, groundwater quality, and migration of contamination. The data will be used to develop a data base on contaminated groundwater plumes to support planning for remedial actions and insure compliance with regulations.

SAVANNAH RIVER PLANT-INTERIM WASTE OPERATIONS .... $ 2,760

Minor Projects $ 670

Minor projects, each costing $75,000 or less, are needed to (1) maintain safety and continuity of operations and (2) add to existing programs in support of the Interim Waste Management Program.

TRU Waste Storage Pads, 643-G $ 800

This provides six additional TRU waste storage pads in the 643-G burial ground. The existing pads will be filled in 1987 and additional storage space is needed for the waste. A lack of approved storage space for TRU waste would affect the operation of the 200-Area B-Lines.

1. Title and location of project: General plan projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

F Diversion Box 1 Retirement Cover, 241-F $ 200

Diversion Box No. 1 in F Area is being prepared for retirement in the near future. The use of a permanent cover upon retirement would eliminate rainwater in leakage and the need for time consuming caulking and sealing of the cell covers.

Contaminated Canyon Equipment Storage Pads, 643-G $ 390

Provides engineered storage pads for contaminated canyon equipment. Such pads currently do not exist but are needed to prevent contaminated rainwater runoff from the storage boxes.

Improved Tank Farm Containment, Phase II, 241-F $ 700

This provides containment huts and radiation monitors at waste tank risers and other process locations not supplied by FY 1984 projects. This provides required flexibility in designating salt concentrate receipt tanks and in transferring waste between tanks. These huts and monitors assure that all active tank risers and other process locations are equipped for containment and detection of radioactive spills.

FEED MATERIALS PRODUCTION CENTER (FMPC)-INTERIM WASTE OPERATIONS............................ $ 1,490

Improved Waste Segregtion $ 165

Waste segregation facilities throughout the plant require miscellaneous upgrading efforts in order to assure stringent management of contaminated waste. The segregation facilities are required in order to minimize the volume of low-level waste requiring disposal.

Graphite Burner $ 250

A new facility is required to provide for volume reduction of scrap graphite, including spent crucibles. The new graphite burner will be installed in an existing FMPC building. The present incinerator will not meet EPA emission standards and must be taken out of service. There is no viable alternative to the new incinerator, since pit storage of waste has been terminated.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plan projects, interim waste operations and long-term waste management technology, various locations — 2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

Additional Decontamination Capacity $ 300

Upgraded facilities for the decontamination of equipment and scrap are required to reduce the volume of contaminated waste and to make additional costly pad space available for equipment and scrap resulting from demolition and removal of old process facilities as part of the ongoing Site Productivity Retention program. Such equipment and scrap contributed to ground and liquid effluent contamination and should be promptly decontaminated.

Controlled Storage Facility $ 200

A new facility is required for interim storage of bulk quantities of contaminated construction rubble prior to disposal. Rubble is generated as a low-level waste during demolition activities associated with the Site Productivity Retention Program.

The new facility will be seepage resistant and will be strictly controlled in order to meet EPA standards for liquid effluents. Without proper liquid effluent control, soil and ground water contamination will occur. The new facility will be used to store the contaminated rubble pending processing in the Low-Level Waste Processing and Shipping System.

Treatment Facility for Barium Chloride Waste Salts $ 75

A facility is required for treatment (passivation) of contaminated salt sludge waste containing barium chloride, a hazardous substance, prior to disposal as low-level waste. The facility will remove the hazardous component and render the waste suitable for disposal as low-level radioactive waste.

Waste Pit Environmental Upgrading $ 500

Retired waste pits, previously used for storage of contaminated materials, are capped with an earthen cover. The existing covers will be upgraded by adding more soil and providing an internal drainage system in order to minimize ground water recharge into the pits, and hence minimize the potential for release of contamination from the pits.

RICHLAND LANDLORD-HANFORD SITE-INTERIM WASTE OPERATIONS.................................... $ 3,690

Capital Work Orders $ 280

These are miscellaneous projects of a capital nature, which are necessary to maintain continuity of operations, protection of the environment, and to provide safeguards for the protection of life and property. Such jobs include additions, improvements, and replacements of structures building services, utilities, and associated equipment.

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

Route 4S Road Improvement $ 900

This project will upgrade 2.32 miles of Route 4S from approximately 1/2 mile southeast of the bottom of the 200 East Hill to just past the AP Tank Farm at 200 East Areas. This is part of the upgrading of Route 4S to meet Washington State Department of Transportation standards.

700 Area Alarm System $ 400

This project will install alarms in the 712 building of the type now in other Hanford locations. Classified documents need additional security precautions, and the project will upgrade the system to the level of protection given to the rest of the site.

Existing alarm systems in the Federal Building would also be replaced to be compatible with the site alarm system.

Classified Waste Destruction Facility $ 350

This facility will handle the destruction of classified documents for the Hanford area. The new facility will accommodate temporary storage of these documents and will house new larger machinery. The new machinery will provide safer more efficient destruction of classified items. The facility will provide a ventilation system that is compatible with current safety recommendations for respirable dust which is not provided in the existing facility. More destruction capacity is provided to meet future demands as well.

Office Building $ 950

This project provides a 15,000 square foot office facility in the 200 East Area. Construction will be wood frame over a slab on grade. This facility will provide office space for 90 to 100 people. Space for a lunchroom, restrooms, office equipment, storage and conference rooms will be provided. The additional office space is required to adequately staff and manage the current work load. Many personnel are currently in temporary office facilities that are to be replaced by this facility.

Additional Water Pump, 182-D $ 400

This project will provide a 6,000 gpm operational spare pump at the 100-D Area pumping station. Piping, valves, pump, electric motor and motor starter are required. This will augment the 100-D Area pumping capacity to 30,000 gpm to provide enhanced reliability to the entire site.

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

Electrical Metering - 300 Area $ 410

This project will provide electrical metering on individual building services in the 300 Area by installing instrument transformers and pulse generating watt-hour demand meters. This project will provide better data on power usage for billing, power management, and conservation programs.

IDAHO NATIONAL ENGINEERING LABORATORY-LANDLORD-INTERIM WASTE OPERATIONS...................... $ 5,560

Miscellaneous and Minor Projects $ 60

These are small subprojects lumped together under one GPP to address smaller emergency or high-priority needs and for ease of administration of projects with lower costs. These projects are sometimes not identified until several weeks before they are constructed. Examples of such projects are drainage corrections, personnel survey station modifications, crane rail modifications for safety, security-related improvements, head bolt heater rack upgrades, culvert replacements, etc.

INEL 1987 Road Program $ 500

This project consists of modification, upgrade or renovation of miscellaneous small and high priority paving projects at various INEL locations. This would include intersection changes, service road upgrades, minor parking lot expansions or other priority projects needed for safety, uninterrupted transport of radioactive materials, security patrols and emergency response, and for other operations traffic. Projects currently identified as candidates for inclusion in this project include parking lot expansions to maintain safe, clear access to facilities, service road paving for use by fuel delivery trucks, intersection modifications, and turnouts for safety reasons.

INEL Safeguards and Security Improvements $ 950

This project will provide safeguards and security improvements at the INEL. This project will include redundant safeguards and security alarms at various INEL locations, road safety improvements at guard station locations, and improved perimeter lighting at various security facilities.

CFA Office Building No. 3 $ 850

This project will complete the long-range plan to consolidate office functions in a centralized location. This new office building (approximately 8,500 square feet) will house personnel currently located in scattered outlying bungalows which are

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

old and both energy- and space-inefficient. Also, the office building will provide space for Idaho Falls personnel to be relocated to the site.

CFA Safety Calibration Laboratory

$ 370

This project will replace the existing calibration laboratory and provide expanded calibration capabilities at the INEL. The new facility will be capable of handling new and existing programs and support functions. Health and safety deficiencies exist in the present facility due to the deterioration of the building, the inadequacy of electrical systems in meeting code requirements, and the inability to control the environment for testing purposes. The new facility will correct all health and safety deficiencies that currently exist and will allow those testing and calibration functions to be performed which are currently impossible due to the absence of an adequate facility.

CFA Lead Pouring Facility

$ 460

This project will replace the current lead pouring facility with an approximate 2,500 square foot building which will house a setup area, storage area, and lead melting area. The current lead pouring facility is 31 years old, has insufficient ventilation (no longer meet OSHA requirements for the removal of lead fumes, etc.), has no permanent heating system, and is housed in an uninsulated metal building. The existing equipment is antiquated and in poor working condition. This project will continue to expand the INEL capability to make lead pours in a safe and efficient manner.

TRA MCC/Swithgear Upgrade

$ 200

Obsolete Motor Control Centers (MCC's) and switchgear will be replaced by this upgrade. Many of these units cannot be maintained due to the unavailability of parts. In addition, the current system cannot accommodate new electrical power requirements. This project will properly allocate electrical loads to support needed programs and future expansion.

TRA Hot Cells Heating and Ventilation Upgrade

$ 110

This project will upgrade the H&V system in the TRA Hot Cells. Presently, there is an imbalance of air pressures resulting in air movement from contaminated to noncontaminated areas. The existing air intake ducts frost over, restricting the flow to the point where the heating system shuts down, and exaggerating the loss of differential pressure zone control in the building.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

TRA Hot Cells Utilities Upgrade	$ 110

This project will upgrade the electrical services outlets in the cell and in the cell-face utility raceways. In-cell plant air, water, vacuum, and inert gas piping and outlets will also be installed. Ground fault interruption protection devices will be installed in selected areas. The existing electrical service is not in accordance with current electrical codes, is partially inoperative, and is insufficient for present needs.

TRA Hot Cells Viewing Window Upgrade	$ 100

This project will upgrade the existing shield window liquid expansion and maintenance support systems and equipment at the TRA Hot Cells. The window zinc bromide expansion tank system, the window oil expansion tank system, and an oil zinc bromide inert gas purge/blanket system will be upgraded. The upgraded window maintenance systems will allow a systematic individual maintenance program to control window deterioration and maintain good viewing characteristics.

TAN Hot Shop Dispatcher Control Console Upgrade	$ 950

This project will relocate all facility control, monitoring, and alarm systems to the TAN Hot Shop dispatcher control console located in the south operating gallery. This will provide a central control console to facilitate facility status checks and control. This project also includes providing duplicate alarms at a continuously manned location.

TAN/WRRTF Motor Control Centers (MCC) No. 5 and No. 6	$ 150

This project will install a 480 V 60 Hz, 3 phase, 4 wire, totally enclosed, dead front, free standing assembly. The motor control center will contain motor circuit breakers and starters. The existing MCC's are becoming increasingly difficult to maintain due to their age and the unavailability of replacement parts. Numerous National Electrical Code (NEC) deficiencies exist which present hazards to maintenance and operating personnel. This project will correct code deficiencies and reduce the possibility of programmatic impacts from the loss of critical circuits due to breakdowns.

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

9. Purpose, Justification of Need for, and Scope of Project: (continued)

TAN Guardhouse and Office Renovation $ 750

This project provides for the renovation of office and guardhouse areas in the TAN guardhouse and office building. This complex was constructed in 1954. Over the past 30 years, various modifications to the office area have left a multitude of different configurations. Office areas are below standard for a productive work environment. The guardhouse area and entrance is poorly laid out and is substandard to other area guardhouses. Renovation will involve minor interior rearrangement, painting, wall covering, and flooring. This project will provide office space for existing personnel and personnel growth projected for the TAN area.

SAVANNAH RIVER - LONG-TERM TECHNOLOGY.. $ 735

Support Facilities, TNX $ 400

This will provide for additional or modified facilities and services at the TNX area associated with DWPF process demonstration and startup. This includes additional electrical capacity, a control room and laboratory facilities to support the Integrated Melter System and the 1/5 scale precipitate Hydrolysis demonstration equipment.

Support Facilities for Operating Personnel, S-Area $ 335

This will provide new facilities, repairs, and maintenance projects related to operations in S-Area. Included is a pre-engineered building for shop space for Savannah River Plant personnel assigned to the maintenance of completed S-Area facilities (i.e., water system, sewage treatment, opeations building, etc.). Also included are miscellaneous small repair and maintenance projects for operations related facilities in S-Area.

10. Details of Cost Estimate:

It is not possible to provide a detailed cost estimate for the projects. Cost estimates for general plant projects are normally included in the request for a construction directive after the need for the work has been established, the scope of the job determined, and the preliminary engineering completed.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations

2. Project No.: 87-D-171

11. Method of Performance:

Design will be on the basis of negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be by fixed-price contracts and by subcontracts awarded competitively.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

Not applicable to projects with a total estimated cost of less than $5 million each.

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

Not applicable to projects with a total estimated cost of less than $5 million each.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: WESF K-3 filter system upgrade, Richland, Washington

2. Project No.: 87-D-172

3. Date A/E work initiated: 2nd Quarter FY 1987

5. Previous cost estimate: None

3a. Date physical construction starts: 2nd Quarter FY 1988

6. Current cost estimate: $3,300
Less amount for PE&D: 0
Net cost estimate: $3,300
Date: 3/85

4. Date construction ends: 1st Quarter FY 1989

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1987	$ 500	$ 500	$ 500	$ 400
1988	2,800	2,800	2,800	2,320
1989	0	0	0	580

8. Brief Physical Description of Project:

This project will provide a new exhaust filter system for the Waste Encapsulation and Storage Facility (WESF). The new filter assemblies will incorporate several features to increase system reliability and environmental safety. Mechanisms will be installed to seal the filter assembly thereby isolating the contamination on the HEPA filters from the environment. As presently conceptualized, prefilter and liquid removal capability will be provided through a system of impingement vanes, de-entrainer pads with on-line flushing capabilities, heaters, and a built-in sump. An in-place test system will be installed to permit individual filter stage leak testing.

The new filter assemblies will be designed to replace the current filters, to provide containment during changeout activities, and to permit the K-3 ducts to be flushed to remove radioactive material deposited in the duct without excessively contaminating or breaching the high efficiency particulate air (HEPA) filter assembly. The filter assemblies are presently planned to utilize the existing filter pit and inlet and outlet connectors to retain the general configuration of the original filters.

The filters shall be designed for remote installation and removal using a conventional boom crane for lifting the filter and manipulating an electric impact wrench.

1.	Title and location of project: WESF K-3 filter system upgrade, Richland, Washington	2.	Project No.: 87-D-172

8. Brief Physical Description of Project: (continued)

Existing utilities will be routed to the filter pit to support the new filter assembly. Demineralized water will be required for the de-entrainer and heater flushing systems, electrical service will be required for the heaters, and steam will be required for the sump jet, instrumentation, sampling, and injection lines. A new waste line will be installed from the filter pits to a waste catch tank.

The exhaust system fans and motors will be upgraded to compensate for the increased differential pressure across the filter due to the addition of de-entrainment equipment.

The FY 1987 appropriation will be utilized for accomplishment of definitive design.

9. Purpose, Justification of Need for, and Scope of Project:

All future operating and surveillance activities at WESF will require a filter system to maintain contamination control in the facility hot cells and canyon areas. The new filter system is needed to reduce the potential for contamination spread to the environs by providing improved containment. The K-3 exhaust ventilation system at the WESF provides filtered ventilation for the facility's processing cells and canyon area. The duct system preceding the HEPA filters has been determined to contain an estimated four to 19 filter loads buildup of contamination, using an amount of cesium and/or strontium equivalent to 40 R/hr to define a load. The current filter system is incapable of handling a large radionuclide loading should some part or all the contamination move to the filter enclosure. When or with what frequency the contamination will migrate towards the HEPA filters, what portion will migrate, why it will move, or how to stop it are all unknowns. The frequent need to replace filter enclosures and the high radionuclide level on the spent filters have highlighted another problem. When the expended filter is lifted from the containment pit the filter internals are exposed to the environs. The potential of spreading contamination to the environment exists. A filter assembly is needed which provides containment during changeout activities and is capable of handling a large surge of radioactive particulate as would occur in a cleaning operation.

If this project is not supported, the transfers of existing contamination in the duct system to the filters could bring plant operations to a halt pending filter changeout. The high radiation exposure and contamination spread potential would necessitate special methods, not currently available at the Hanford site, to be used. A recovery technique has been postulated that would take nearly 14 months and is estimated to cost $3,100,000 to $4,000,000.

10. Details of Cost Estimate: a/

	Item Costs	Total Costs
a. Engineering, design, and inspection at approximately 27% of construction costs, item b..		$ 600

1. Title and location of project: WESF K-3 filter system upgrade, Richland, Washington

2. Project No. 87-D-172

10. Details of Cost Estimate: a/ (continued)

	Item Costs	Total Costs
b. Construction costs		2,200
(1) Special facilities - filters, sumps, heaters, leak detectors, impingement vanes	$ 2,200	
c. Standard equipment		0
Subtotal		$ 2,800
d. Contingency at approximately 18% of above costs (items a, b)		500
Total estimated cost		$ 3,300

a/The estimate is based on conceptual design effort that is 100% complete.

11. Method of Performance:

Design will be performed by the onsite architect-engineer contractor. Construction and procurement will be done by the onsite construction contractor. The installation of filter assemblies and procurement of jumper parts and HEPA filters shall be performed by the operating contractor.

Funding Schedule of Project Funding and Other Related Funding Requirements:

Not applicable to projects with a TEC of less than $5 million.

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

Not applicable to projects with a TEC of less than $5 million.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: 242-A evaporator crystallizer upgrade, Richland, Washington

2. Project No.: 87-D-173

3. Date A/E work initiated: 2nd Quarter FY 1987

5. Previous cost estimate: None

3a. Date physical construction starts: 4th Quarter FY 1987

4. Date construction ends: 1st Quarter FY 1991

6. Current cost estimate: $12,600
Less amount for PE&D 0
Net cost estimate: $12,600
Date: 3/85

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1987	$ 2,800	$ 2,800	$ 2,800	$ 1,800
1988	7,200	7,200	7,200	7,600
1989	1,900	1,900	1,900	1,000
1990	700	700	700	1,900
1991	0	0	0	300

8. Brief Physical Description of Project:

This project will upgrade the existing Evaporator Crystallizer (E/C) to extend its life through the year 2000. The project will upgrade equipment and systems which have a history of maintenance problems, are not expected to withstand operation through the year 2000, or need corrective measures to meet existing standards. This upgrade will include implementation of system changes which will improve the overall system operating efficiency.

Examples of modifications/upgrades which will be required are as follows:

o Decontamination facility: An East area decontamination facility will be added onto the E/C. This facility will primarily support E/C operations since space for maintenance and decontamination is not available in the E/C. The decontamination facility will have an approximate overall dimensional floor plan of 57 by 32 feet with an approximate total square footage of 2,150 square feet. The building will be approximately three stories high (46 feet). Rooms in the decontamination facility will consist of the following: a viewing corridor, a chemical make-up room, pump storage areas, decontamination and maintenance areas, airlocks, and an extension of the existing crane maintenance platform. The decontamination facility will have its own heating, ventilating, and air conditioning (HVAC) system, with an

8. Brief Physical Description of Project: (continued)

approximate flowrate of 6,500 cfm. The decontamination facility will be interlocked with the upgraded HVAC that will be installed as part of this project. Fire protection will be provided throughout all areas, and safety showers will be installed in the chemical make-up room.

- Electrical power: A new emergency power generator shall be provided for the evaporator. This generator shall have 24-hour maintenance-free capabilities and be sized to supply electrical power to existing systems and additional systems installed by this project. No building will be required to house this generator. A new 1500KVA substation will be added to meet current and future electrical demands.

- Lighting: The existing process area lighting system will be replaced with an improved, waterproof, energy efficient and lower maintenance lighting system.

- Insulation: The vapor/liquid separator will be insulated to improve capabilities by sending more concentrated slurries to the tank farms. This insulation will allow the process temperature to go to a maximum of 200°F.

- Condensers: A new primary condenser with design features to reduce corrosion will be installed. This condenser will have appropriate instrumentation and controls installed to monitor the cooling water and process vapor. This instrumentation and control will be tied into the new monitor and control system (MCS). The intermediate and after-condensers will be replaced with a mechanical vacuum pump system compatible with the new process control system.

- Pumps: The recirculation pump shall be upgraded to increase temperature/amperage limits, and have vibration and acoustic analysis equipment installed. The slurry out system shall be upgraded to allow enhanced pumping of double shell slurry (DSS) to the AP Tank Farm. This will be achieved with an upgrade to the slurry out pump and the installation of a booster pump station. The booster pump station will be an approximately 16 by 16 feet minature vault with an approximate area of 250 square feet. The station will have pumps, jumpers, an HVAC system with an approximate flow rate of 1,000 cfm, and other equipment necessary to assist the transport of concentrated slurry from the E/C to the 241-AP Tank Farm. The station will be approximately 14 feet below grade. The booster station will receive and transfer waste via the existing supernate and slurry lines going from the 241-AW Tank Farm to the 241-AP Tank Farm. Piping will be insulated, have cathodic protection, and other design features to be compatible with those of the 241-AP Tank Farm. Other existing pumps will be replaced/upgraded as necessary to meet the extended life of the E/C and the new process criteria.

- Heating, ventilation, and air conditioning: The existing HVAC system will be provided with a new control system as part of the new MCS. The HVAC MCS shall be interfaced with the process MCS only to the extent of providing input to the monitors. Modifications in HVAC zones will be made to meet the requirements of ERDA 76-21, "Nuclear Air Cleaning Handbook" (rezoning areas, installing backflow preventors, installing equipment to implement the rezoning requirements, etc.).

1. Title and location of project: 242-A evaporator crystallizer upgrade, Richland, Washington
2. Project No.: 87-D-173

8. Brief Physical Description of Project: (continued)

- o Service crane: Upgrades in the service crane will include the installation of a remote television monitor camera, a second auxiliary hook, a general upgrade to insure crane support through the extended life of the evaporator, and expanding its coverage area to include the decontamination facility.

- o Communication system: A new communications system will be installed to increase personnel operating efficiency. The new communications system will allow personnel to communicate between zones.

- o Bottom valves: The bottom dump valves will be upgraded. The new valves will reduce maintenance and eliminate the difficulty of obtaining parts.

- o Sampling system drain: A drain will be added to the slurry sampler to allow draining of the sampler's jumper. This will reduce operational constraints due to having liquid trapped in the jumper.

A new MCS will be included to improve system operating efficiency and provide operators with the ability to monitor and record data to improve the quality control of slurry outputs, thereby reducing waste volume. Various systems (reboiler, de-superheater, etc.) will have instrumentation and controls upgraded to be compatible with the new MCS.

Many of the project upgrades to the evaporator system and equipment will have to be performed in radioactively contaminated zones. These work conditions will add significantly to project construction costs.

The FY 1987 appropriation will be utilized for accomplishment of definitive design, initiation of advance procurement and award of the Phase I fixed price construction contract. Construction will occur in two phases due to the need for the evaporator to be operational. The majority of project construction will be accomplished during scheduled operational shutdowns. These shutdown periods of 9 months and 5 months will occur within a 3-year time period.

9. Purpose, Justification of Need for, and Scope of Project:

Currently, the E/C is the cornerstone of waste management operations at the Hanford Site. Because future processing scenarios are not finalized at this time, the E/C must be upgraded to continue to be the major contributor to waste management operations. To date, the E/C has reduced waste volumes by approximately 33.5 million gallons. Serving in a primary role, the E/C will be required to reduce waste volumes an additional 33 to 58 million gallons. This would eliminate the need to build 33 to 58 non-aging waste tanks. Signs of wear from extensive operations, increased future processing demands, and extended operating life indicate that continued operation would be difficult without major downtime for repairs. Future operation and efficiency is projected to decrease even more as the E/C reaches its 10-year design life in 1987. In addition, upgrades will be required to meet existing standards. In order to avoid increased downtime and potential negative impact on Waste Management operations, an upgrade of the facility is required. The upgrade will repair

1. Title and location of project: 242-A evaporator crystallizer upgrade,
Richland, Washington

2. Project No.: 87-D-173

9. Purpose, Justification of Need for, and Scope of Project: (continued)

and reduce system wear, increase operating efficiency ($4,000,000 current annual operating costs), and extend the operational life of the E/C through the year 2000. The increased capabilities of the E/C will allow waste management operations to meet projected demands within anticipated funding limits.

The upgrades will be centered around three areas: 1) increase the E/C's operating efficiency; 2) bring the E/C into compliance with existing standards: 3) double the operational life of the E/C by extending the operational life through at least the year 2000.

The area 1 upgrades will improve operating efficiency by increasing the E/C's capabilities to produce a concentrated slurry and by reducing operational downtimes. The increased capabilities to produce more concentrated slurries will allow transport of slurries with viscosities approximately 62 percent greater than current limitations. This will in turn allow increases in waste volume reduction above current limits of approximately 25 percent. The increased capability items include adding a new process control system for better monitoring and control of the processes and upgrading the slurry transport system by upgrading the slurry out pump, installing a booster pump station, and insulating the vapor/liquid separator. The upgrades will also increase the recirculation pump capabilities to reduce operational impacts due to fouling, upgrade various control variables (instrumentation, vacuum generators, etc.) to be consistent with the new control system, and add a decontamination facility to the E/C.

Operational downtimes will be reduced by the decontamination facility, which will primarily support E/C operations, but will also be used to support 200 East area tank farm operation. This support for the E/C and the tank farms will be to avoid constraints resulting from meeting as low as reasonably achievable (ALARA) and Department of Energy (DOE) requirements for repair and transportation of radioactive equipment (DOE Order 5480.1A, Chapter III, "Safety Requirements for the Packaging of Fissile and Other Radioactive Materials.")

Current area 2 upgrades will consist of upgrading the building HVAC to meet recommendations of the Energy Research and Development Administration (ERDA) 76-21, "Nuclear Air Cleaning Handbook."

Area 3 upgrades include replacing existing pumps, valves, and lighting fixtures, and upgrading the service crane. This will reduce repair constraints as existing equipment and parts are becoming obsolete, and repair kits and parts are difficult and will become impossible to obtain.

1. Title and location of project: 242-A evaporator crystallizer upgrade, Richland, Washington — 2. Project No.: 87-D-173

10. Details of Cost Estimate: a/

	Item Cost	Total Costs
a. Engineering, design and inspection at approximately 22% of construction costs (items b-e)		$ 1,900
b. Construction costs		7,400
(1) Buildings - expansion of evaporator for decontamination and storage facility (2,150 ft @ $470/sq. ft)	$ 1,020 b/	
(2) Utilities - substation installation	280	
(3) Special facilities - process piping insulation, condensors, pumps, HVAC and service crane modifications	6,100	
c. Standard equipment		0
d. Major computer items; computertized process monitor and control system		1,200
e. Removal less salvage		0
Subtotal		$ 10,500
f. Contingency at approximately 20% of above costs		2,100
Total project cost		$ 12,600

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a/ Cost estimates are based on complete conceptual design and include extensive work in high radiation zones.

b/ High unit cost due to: (1) a seismic category I concrete addition to a radioactively contaminated structure; and (2) this building will be a 46 feet high multi-bay type structure.

11. Method of Performance:

Design and inspection will be performed by the onsite architect-engineer contractor. Construction and procurement will be performed by the onsite construction contractor for contaminated work, with the balance by an offsite contractor on a fixed price contract. Procurement of engineered and long-lead equipment, installation of pumps and jumpers, tie in of "hot" utilities and burial of contaminated equipment shall be performed by the operating contractor.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: 242-A evaporator crystallizer upgrade, Richland, Washington

2. Project No.: 87-D-173

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	TOTAL
a. Total project costs							
1. Total facility costs							
a. Construction line item....	$ 0	$1,800	$ 7,600	$ 1,000	$ 1,900	$ 300	$12,600
b. PE&D.....................	0	0	0	0	0	0	0
c. Inventories...............	0	0	175	25	0	0	200
Total direct costs........	$ 0	$1,800	$ 7,775	$ 1,025	$ 1,900	$ 300	$12,800
2. Other project costs							
a. R&D necessary to complete construction.......	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
b. Conceptual design costs......................	448	0	0	0	0	0	448
c. Other project related costs......................	$ 80	$ 200	$ 220	$ 150	$ 250	$ 75	$ 975
Total other project costs......................	$ 528	$ 200	$ 220	$ 150	$ 250	$ 75	$ 1,423
Total project costs.......	$ 528	$2,000	$ 7,995	$ 1,175	$ 2,150	$ 375	$14,223

b. Other related annual costs (estimated life of project: 11 years)

1. Facility operating costs..	$ 4,000
2. Programmatic operating expenses directly related to the facility..........................	0
3. Capital equipment not related to construction but related to programmatic effort in the facility..	100
4. Maintenance, repair, GPP or other construction related to programmatic effort in the facility...	450
Total related annual costs..	$ 4,550

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project funding
  (1) Total facility
    (a) Inventories - inventories necessary to put the facility into use.

1. Title and location of project: 242-A evaporator crystallizer upgrade, Richland, Washington   2. Project No.: 87-D-173

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements: (continued)

- (2) Other project costs
  - (a) R&D necessary to complete construction - none.
  - (b) Conceptual design - funding necessary to complete conceptual design.
  - (c) Other project related costs - decontamination, project management and support.

b. Total related funding requirements - facility is estimated to be used 25 years for its programmatic purpose.

- (1) Facility operating costs - current operating costs of the facility is $4,000,000/yr. No change will occur due to the upgrades provided.
- (2) Programmatic operating expenses related directly to the facility - This project supports the overall waste reduction mission at Hanford.
- (3) Capital equipment not related to construction but related to programmatic efforts in the facility - $100,000 based on operating history to date.
- (4) Maintenance, repair, GPP or other construction related to programmatic effort in the facility - $450,000 estimated cost is based on experience to date less forecasted savings associated with the upgraded systems.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: 241-AQ tank farm, Richland, Washington

2. Project No.: 87-D-174

3. Date A/E work initiated: 1st Quarter FY 1987

3a. Date physical construction starts: 1st Quarter FY 1988

4. Date construction ends: 3rd Quarter FY 1992

5. Previous cost estimate: None

6. Current cost estimate: $58,000
Less amount for PE&D: 0
Net cost estimate: $58,000
Date: 3/85

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1987	$ 3,300*	$ 3,300*	$ 3,300*	$ 2,800
1988	24,800	24,800	24,800	7,800
1989	25,400	25,400	25,400	14,300
1990	4,500	4,500	4,500	15,700
1991	0	0	0	12,800
1992	0	0	0	4,600

8. Brief Physical Description of Project:

This project will provide four additional underground double-shell tanks for storage of high-heat radioactive liquid aging waste, convert one existing double-shell waste storage tank to handle high-heat waste, encased piping to existing waste transfer facilities, instrumentation and auxiliary equipment for monitoring the waste, improvements to land, additional support and auxiliary facilities, and improvements for controlling radioactive waste to minimize the potential for release to the environment.

The proposed construction site for the four additional tanks is west of the existing aging waste tank farms. This 15-acre parcel will be improved to include access roads, security fencing, and area lighting. Existing facilities, including waterlines, electrical power lines, process lines, and signal cables will be rerouted or removed by this project. The existing waste storage tank to be converted to handle high-heat waste is one of seven tanks located in the 241-AN Tank Farm. Construction utilities, including power and water, will be provided by the project.

*Actual FY 1987 BA request is $2,100,000. Assumes $1,200,000 will be provided through reprogramming from prior year projects, i.e., Project No. 82-N-104, $67,000; Project No. 82-N-107, $550,000, and Project No. 83-D-157, $583,000.

1. Title and location of project: 241-AQ tank farm, Richland, Washington — 2. Project No.: 87-D-174

8. Brief Physical Description of Project: (continued)

Eight new buildings will be constructed by this project; seven for the new tank farm and one for the conversion of the existing tank. These include: 1) a prefabricated metal instrumentation building (approximately 650 square feet); 2) a reinforced concrete standby generator/compressor building (approximately 1,400 square feet); 3) a reinforced concrete ventilation facility (approximately 7,000 square feet, including the various pits); 4) a prefabricated metal service enclosure (approximately 150 square feet); 5) a prefabricated metal water treatment building (approximately 1,030 square feet); 6) prefabricated metal sampling facility (approximately 400 square feet); and 7) a reinforced concrete airlift circulator control building (approximately 625 square feet); and 8) a prefabricated metal compressor building (approximately 200 square feet). The prefabricated metal buildings will be designed to meet the requirements of the Uniform Building Code, while the reinforced concrete building will be designed to resist a Design Basis Accident.

Other structures to be constructed as a part of this project include: 1) two cooling towers as part of the heat removal system, and 2) approximately 2,000 feet of piping for transferring waste to and/or from PUREX, B-Plant, and other tank farm related facilities; and 3) approximately 1,100 feet of piping for transferring waste to the converted tank.

Utility service will be extended to the project site for use in the tank farm operation. Electrical power, standby electrical power (diesel generators), raw water, process air, instrument air, and steam will be utilized in normal operation of the tank farm and converted tank.

The additional tanks will be designed similar to the existing one-million gallon double-shell tanks, which consist of a free standing, stress-relieved carbon steel tank within a carbon steel lined, reinforced concrete structure, but with the added capability to accommodate aging waste. The tanks will be equipped with pumps, pump pits, slurry distributors, waste retrieval pits, waste agitation and cooling systems, integral leak detection, radiation, temperature, pressure, liquid level and sludge level instrumentation, high efficiency filter systems for ventilation exhaust, area radiation alarms, and controls.

Instrumentation will be provided to detect leakage from the primary tank to the carbon steel liner of the secondary tank. Equipment will be available for removing the waste from the secondary tank should a primary tank failure occur. Exhaust air will be double-filtered through high-efficiency filters prior to release to the environment. Measurement of radioactivity released to the environment will be continuous, and the concentration of radiosotopes released will be maintained below agency guidelines. Liquid level and temperature instrumentation will be monitored by the Computer Automated Surveillance System. Waste transfer lines will be constructed with encasements for secondary containment of the radioactive waste. Leak detection devices and pressure testing capabilities will be provided for the encased piping to permit routine monitoring for leaks. Leakage into the encasement due to failure of the primary piping will drain to and be collected in double-contained waste storage tanks or catch tanks as required. The support and auxiliary facilities and improvements for control of radioactive waste will include diversion boxes, valve pits, control room modifications, provisions to reduce radiation exposure, and improvements in processes for volume reduction of high-level waste.

8. Brief Physical Description of Project: (continued)

During construction of the 241-AN tank farm, one of the seven double-shell tanks was constructed with air-lift circulators and the necessary dome penetrations to allow conversion to high-heat waste storage. This project will provide additional components required to complete the conversion: steam heat coil for tank contents preheating; compressed air system, including controls, to power the existing air lift circulators; two sluice pits to aid waste retrieval; ventilation system to remove waste-generated heat; an emergency power supply; and encased piping for transporting high-heat waste to the converted tank.

The FY 1987 appropriation will be used for initiation of Definitive Design and advanced procurement.

9. Purpose, Justification of Need for, and Scope of Project:

The proposed facilities are required for storage of PUREX-generated waste resulting from processing of fuel from the N Reactor, Fast Flux Test Facility, Shippingport, and other Hanford operations. The 1983 and 1984 waste volume projections identified five changes in forecasted Hanford operations which created a need for 3 to 4 million gallons of additional tank space:

- PUREX restart date was moved up from April 1984 to October 1983.
- N Reactor operation was extended from FY 1993 to FY 1995.
- Beginning pretreatment of cladding removal waste and neutralized current acid waste in the late 1980's.
- Dedication of a grout feed tank for 100-N Area waste.
- Extended Plutonium Finishing Plant operation from 1985 to at least 2015.

Preliminary issuance of the 1985 waste volume projections, in May 1985, affirms the need for AQ Tank Farm and further predicts a shortage of high-heat spare, and contingency tank space beginning in FY 1987 until AQ Tank Farm becomes operational in 1993.

Failure to support this project will cause one or more of the following impacts:

- PUREX reprocessing plant operations will have to be curtailed until other methods of storing wastes are provided. (Operational shutdown cost is approximately $160,000 per day.)

- Existing aging waste tanks will be 23 years old by the time construction of this project is completed. In the event of an aging waste tank failure, Hanford will be without adequate spare capability until the project was completed.

- Segregation of feed for the glass vitrification facility will not be possible after filling one existing aging waste tank in 1986. This would require mixing of liquid wastes that should be kept segregated, thus increasing final disposal costs.

1. Title and location of project: 241-AQ tank farm, Richland, Washington
2. Project No.: 87-D-174

9. Purpose, Justification of Need for, and Scope of Project:

- o Alternative operating scenarios that provide for no feed pre-treatment would increase the new tank requirement to 10 non-aging waste tanks.

- o Transfer of waste from the existing aging waste tanks to B-Plant will be impacted if additional routing, other than that utilized by PUREX transfers, is not provided. The failure to provide the additional tranfer lines could impact the operations of both PUREX and B-Plant.

These tanks will also provide contingency storage for liquid waste from other Hanford operations and increase the tank farm operating flexibility. The annual estimated operating and surveillance cost of the proposed tank farm and converted tank is approximately $1,000,000 based on the current operating budget. This project includes the engineering, design, inspection, land improvement, and procurement for the construction of four double-shell aging waste tanks and auxiliary facilities at Hanford.

10. Details of Cost Estimate: a/

	Item Cost	Total Costs
a. Engineering, design and inspection at approximately 18 percent of construction costs (item b)............		$ 8,100
b. Construction costs....................................		44,000
(1) Improvements to land, including earthwork, access roads, fencing, lighting, existing facilities relocation and temporary construction utilities..	$ 2,500	
(2) Buildings - instrumentation, standby generator/compressor, ventilation, service sampling, water treatment and airlift circulator control (approximate total area of 11,500 square feet at $217/sq ft.)................................	2,500	
(3) Other structures - cooling towers, transfer piping..	3,200	
(4) Utilities - including electrical power, water, air and steam..................................	1,100	
(5) Special facilities - includes tanks, process piping and pits, ventilation and cooling system, instrumentation, auxiliary equipment, agitation system, cathodic protection system and engineered equipment........................	34,700	

1. Title and location of project: 241-AQ tank farm,
Richland, Washington

2. Project No.: 87-D-174

10. Details of Cost Estimate: (continued)

	Item Cost	Total Costs
c. Standard equipment..................................		0
d. Removal less salvage................................		0
Subtotal............		$ 52,100
e. Contingency at approximately 11 percent of above costs (a and b)................................		5,900
Total project cost...		$ 58,000

11. Method of Performance:

Design and inspection will be accomplished by the onsite architect-engineer. The majority of the construction effort will be performed by offsite fixed-price contractors. A portion of the work (e.g. work in contaminated areas and the 107-AN tank conversion) will be performed by the onsite CPAF construction contractor.

a/Based on completed conceptual design.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	TOTAL
a. Total project costs								
1. Total facility costs								
a. Construction line item	$ 0	$2,800	$ 7,800	$14,300	$15,700	$12,800	$ 4,600	$58,000
b. PE&D	0	0	0	0	0	0	0	0
c. Inventories	0	0	0	100	0	300	200	600
Total direct costs	$ 0	$2,800	$ 7,800	$14,400	$15,700	$13,100	$ 4,800	$58,600
2. Other project costs								
a. R&D necessary to complete construction	$ 200	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 200
b. Conceptual design costs	500	0	0	0	0	0	0	500

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: 241-AQ tank farm,
Richland, Washington

2. Project No.: 87-D-174

12. Funding Schedule of Project Funding and Other Related Funding Requirements: (continued)

	Prior Years	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	TOTAL
c. Other project related costs	400	200	200	200	200	200	200	1,600
Total other project costs	$1,100	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 2,300
Total project costs	$1,100	$3,000	$ 8,000	$14,600	$15,900	$13,300	$ 5,000	$60,900

b. Other related annual costs (estimated life of project: 50 years)

1. Facility operating costs	$ 1,000
2. Programmatic operating expenses directly related to the facility	0
3. Capital equipment not related to construction but related to programmatic effort in the facility	200
4. Maintenance, repair, GPP or other construction related to programmatic effort in the facility	0
Total related funding requirements	$ 1,200

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project funding
   1. Total facility
      (a) Inventories - initial stock of spare parts required for operation
   2. Other project costs
      (a) R&D necessary to complete construction - R&D will be performed to develop most appropriate ventilation, agitation, and waste transfer systems/equipment.
      (b) Conceptual design - conceptual design effort for this project.
      (c) Other project related costs - these costs are associated with project management activities of the operating contractor.

b. Total related funding requirements
   1. Facility operating costs - estimated annual expense of $1,000,000 for operation of the new waste storage tank farm including process engineering support, radiation protection to support routine tank farm operations, surveillance acivities, raw water usage, electrical power usage, plant design, planning and scheduing efforts and replacement of non-capital equipment.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: 241-AQ tank farm, Richland, Washington

2. Project No.: 87-D-174

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

2. Programmatic operating expenses related directly to the facility - This project will primarily support PUREX operations.
3. Capital equipment not related to construction but related to programmatic efforts in the facility - average annual replacement cost for items such as process pumps, agitators, monitoring and processing equipment, etc., is estimated to be $200,000.
4. Maintenance, repair, GPP or other construction related to programmatic effort in the facility - funds required for normal tank farm maintenance.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Steam system rehabilitation, phase I,
Richland, Washington

2. Project No.: 87-D-175

3. Date A/E work initiated: 2nd Quarter FY 1987

3a. Date physical construction starts: 2nd Quarter FY 1988

4. Date construction ends: 1st Quarter FY 1989

5. Previous cost estimate: None

6. Current cost estimate: $13,500
Less amount for PF&D: 0
Net cost estimate: $13,500
Date: 6/85

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1987	$ 900	$ 900	$ 900	$ 900
1988	12,600	12,600	12,600	11,500
1989	0	0	0	1,100

8. Brief Physical Description of Project:

This project is the first phase of a projected two phase effort to upgrade or replace existing 40 year old power houses. Phase I includes construction of a new steam tie-line capable of transferring steam between the existing 200 East and 200 West steam generation and distribution systems. The steam tie-line will be approximately six miles in length and will have capacity of 200,000 pounds per hour of steam. Existing water services, emission controls, coal receiving structures, steam distribution lines and electrical distribution systems will be utilized. The tie-line shall be of standard industrial design and manufacture.

The appropriation for FY 1987 will fund the engineering contract and bid preparation for the steam line construction contract.

9. Purpose, Justification of Need for, and Scope of Project:

This phase of the project will provide additional steam supply from 200 West to supplement steam requirements of the 200 East chemical separation area. The tie-line is an essential prerequisite to Phase II construction.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Steam system rehabilitation, phase I, Richland, Washington
2. Project No.: 87-D-175

9. Purpose, Justification of Need and Scope of Project: (continued)

The present Hanford 200 East and West Area steam plants were built in the early 1940's. Normal operational wear has reduced plant capacities while program growth has greatly increased steam demand in the 200 East Area with 200 West Area demand remaining relatively unchanged.

Current peak steam demand in the East Area exceeds the normal supply capability by approximately 100,000 pounds per hour and normal operational demand requires operation of all five existing boilers for seven months of the year and four boilers the remainder of the year. This operational mode does not allow maintenance at the required intervals, contributes to the further deterioration of the boiler and support systems, and does not provide any reserve capacity in the event of an unscheduled boiler outage. Recent operating history has shown that unplanned steam plant outages result in immediate curtailment of plutonium production operations as well as other support operations required for plutonium production. Unless this condition is corrected, further unplanned steam outages are expected to result in 20 to 70 days of downtime per year. An economic penalty could result in excess of $220,000 per day: $160,000 per day for Chemical Processing Facilities and $60,000 per day for Waste Management Facilities. This results in an impact range of from $4,400,000 to $15,400,000 per year, not including production schedule slippages. The production plants affected by the shortfall are:

- Plutonium Uranium Extraction Facility (PUREX)
- Waste Separation Facility (B-Plant)
- Evaporator/Crystallizer
- Tank Farms

In summary, steam plant production shortfalls have occurred and will continue to occur more frequently as the steam plant components further deteriorate. These shortfalls have impacted and will continue to impact current programs. This project will permit use of excess steam capacity in the 200 West Area for interim needs in the 200 East Area, and will provide an alternate steam supply during Phase II construction.

10. Details of Cost Estimate: a/

	Item Cost	Total Cost
a. Engineering, design and inspection at approximately 10.5 percent of construction costs (item b)		$ 1,100
b. Construction costs		10,500
(1) Utilities - steam tieline	$ 10,500	
c. Standard equipment		0

1. Title and location of project: Steam system rehabilitation, phase I, Richland, Washington

2. Project No.: 87-D-175

10. Details of Cost Estimate: a/ (continued)

	Item Cost	Total Cost
d. Removal less salvage..		0
Subtotal.................		$ 11,600
e. Contingency at approximately 16% of above costs....................		1,900
Total project cost		$ 13,500

a/ Cost estimates are based on completed conceptual design for both phases I and II of the project.

11. Method of Performance:

Definitive design will be performed under a negotiated A/E contract. Procurement and construction will be performed under fixed-price contracts awarded on the basis of competitive bids to the maximum extent possible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Years	FY 1987	FY 1988	FY 1989	TOTAL
a. Total project costs					
1. Total facility costs					
a. Construction line item	$ 0	$ 900	$11,500	1,100	$13,500
b. PE&D	0	0	0	0	0
c. Inventories	0	0	0	0	0
Total direct costs	$ 0	$ 900	$11,500	$ 1,100	$13,500
2. Other project costs					
a. R&D necessary to complete construction	$ 0	$ 0	$ 0	$ 0	$ 0
b. Conceptual design costs	325	0	0	0	325
c. Other project related costs	$ 150	$ 100	$ 100	$ 100	$ 450
Total other project costs	$ 475	$ 100	$ 100	$ 100	$ 775
Total Project Costs	$ 475	$1,000	$11,600	$ 1,200	$14,275

1. Title and location of project: Steam system rehabilitation, phase I, Richland, Washington — 2. Project No.: 87-D-175

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

b. Other related annual costs (estimated life of project: 25 years)

1. Facility operating costs	$ 0
2. Programmatic operating expenses directly related to the facility	0
3. Capital equipment not related to construction but related to programmatic effort in the facility	100
4. Maintenance, repair, GPP or other construction related to programmatic effort in the facility	100
Total related funding requirements	$ 200

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project funding
  1. Total facility - no narrative required.
  2. Other project funding
    (a) R&D necessary to complete construction - none.
    (b) Conceptual design - $325,000 conceptual design effort for this project.
    (c) Other project related costs - $450,000 associated with project management and support.

b. Total related funding requirements
  1. Facility operating costs - none.
  2. Programmatic operating expenses directly related to the facility - The steam generated by the coal-fired boilers will be consumed by the Hanford facilities and will be liquidated proportionately to the programmatic users.
  3. Capital equipment not related to construction but related to programmatic efforts in the facility - capital equipment necessary to support operation
  4. Maintenance, repair, GPP or other construction related to programmatic effort in the facility - maintenance required to maintain continuity of operation

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

1. Title and location of project: Test reactor area liquid radioactive waste cleanup system, phase III, Idaho National Engineering Laboratory (INEL), Idaho

2. Project No.: 87-D-177

3. Date A-E work initiated: 1st Quarter FY 1987

3a. Date physical construction starts: 2nd Quarter FY 1988

4. Date construction ends: 4th Quarter FY 1990

5. Previous cost estimate: None
Date:

6. Current cost estimate: $ 5,500
Less amount for PE&D: 0
Net cost estimate: $ 5,500
Date: 3/85

7. Financial Schedule:

Fiscal year	Authorization	Appropriations	Obligations	Costs
1987	$ 700	$ 700	$ 700	$ 400
1988	3,900	3,900	3,900	1,100
1989	900	900	900	1,600
1990	0	0	0	2,400

8. Brief Physical Description of Project:

This project consists of modifications at the Test Reactor Area (TRA) to implement Phase III of the TPA Liquid Waste Control Program. The objective is to eliminate release of radioactive and hazardous liquid from TRA. To accomplish this, the liquid waste that is collected by the warm drain systems at TRA facilities and processed by the equipment installed during Phase II will be stored in two 60,000 gallon tanks at the Materials Test Reactor Process Water Building and one 10,000 gallon tank at the Advanced Test Reactor (ATR). The water stored in the tanks will be recycled back to ATR and the Materials Test Reactor (MTR) to be used in some of the water make-up systems. A cross-tie between liquid waste streams will also be provided for existing canals located at two low-power nuclear reactor facilities within TRA. Additional cooling will be provided for one of these facilities which requires extremely close temperature control. An existing liquid radioactive waste leaching pond will be lined with a waterproof barrier to prevent seepage from reaching the aquifer. The pond will then allow solar evaporation of liquid, eliminating all direct liquid waste discharges from TRA.

The budget authority of $700,000 requested in FY 1987 would allow Title I, preliminary design, to be completed by the third quarter FY 1987. Title II, final design, would be approximately 50 percent complete by the end of FY 1987.

1. Title and location of project: Test reactor area liquid radioactive waste cleanup system, phase III, Idaho National Engineering Laboratory (INEL), Idaho
2. Project No.: 87-D-177

8. Brief Physical Description of Project: (continued)

Long lead Government-furnished material (GFM) procurement commitments for instrumentation and pumps will be made during the fourth quarter FY 1987. Project management activities for design development and long lead procurement initiations is included in the FY 1987 BA/BO estimate.

9. Purpose, Justification of Need for, and Scope of Project:

TRA radioactive liquid waste discharge consists primarily of effluents from the ATR. Other sources include effluents from several other nuclear facilities and radiochemistry laboratories. Most of these facilities were built in the 1950's and early 1960's when the use of ion exchange in the soil (a leaching pond) was an acceptable method of removing radioactivity from liquid waste. Acceptable radioactive discharge levels during that period followed controlled area release guidelines for liquid waste.

Present DOE Orders require the use of alternatives other than the use of soil columns to remove radioactivity from waste, and are to be implemented as soon as technically and economically practicable. This philosophy also redefines the acceptable discharge levels as the uncontrolled area release guidelines. Past TRA discharges were typically 140 million gallons per year of radioactive liquid, containing approximately 1,900 curies of treatable radioactivity and up to 300 curies of tritium. Based on 1975 data, TRA discharges were greater than 20 times the treatable discharges from all commercial nuclear power plants combined.

As a result of phased cleanup efforts initiated in 1975 by the TRA Water Recycle and Pollution Control (Phase I) project, discharges were reduced to about 42 million gallons per year and 130 curies per year of treatable radioactivity, excluding tritium. Construction was completed on this project in 1980. The 1981 TRA Cleanup System (Phase II) project continues the treatment of this waste and is anticipated to further reduce the discharge to 13 million gallons per year and approximately 50 curies per year of treatable radioactivity, excluding tritium. This current phase is scheduled to be completed in 1985.

The project proposed by this request represents the final phase: reducing direct radioactive liquid effluents from TRA to zero. Projects completed to date have met or exceeded the anticipated effluent reductions. Neither the Phase I nor the Phase II projects were expected to reduce tritium discharges from TRA, and this radioactivity is still expected to exceed leaching pond soil discharge requirements.

The tritium discharges from TRA liquid waste range from about 100 to 300 curies per year. A 5-year average indicated that about 40 percent of the total tritium discharged in liquid on the INEL is from TRA. This radioactive isotope is chemically similar to hydrogen, a constituent of water; and as such, the tritium is not removed by normal treatment processes, including the now unacceptable leaching pond treatment. As a result, the majority of the tritium discharged from TRA reaches the aquifer. Studies have shown that tritium is present in the aquifer, and its migration is being closely monitored. However, significant public pressure exists for the termination of all tritium discharges. This project will

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test reactor area liquid radioactive waste cleanup system, phase III, Idaho National Engineering Laboratory (INEL), Idaho

2. Project No.: 87-D-177

9. Purpose, Justification of Need for, and Scope of Project: (continued)

eliminate all radioactive liquid discharges from TRA; therefore, it will prevent tritium from entering the aquifer and allow TRA to meet current soil discharge guidelines. As explained above, a deferral of funding will result in a continued annual discharge of approximately 100 to 300 curies of tritium, as well as 50 curies of mixed activation and fission products into the leaching pond and potentially to the aquifer.

10. Details of Cost Estimate:*

	Item Cost	Total Cost
a. Engineering, design,* inspection at approximately 12% of item b		$ 480
b. Construction costs		3,860
(1) Improvements to land (clearing, grading, backfill, sheeting, fencing)	$ 660	
(2) Buildings and structures (excavation, concrete, steel, roofing, H&V, insulation)	910	
(3) Utilities (water, steam and condensate, electrical, air)	220	
(4) Equipment (piping, valves, heaters, ion exchanger, pumps, filters, tanks, instruments)	2,010	
(5) Demolition and removal (concrete cutting, piping reroute, excess equipment removal)	60	
c. Contingency at approximately 27% of above costs**		1,160
Total estimated costs		$ 5,500

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* Based on conceptual design at 100 percent complete.

** Contingency costs reflect the inability to accurately assess both the degree of radioactivity that will be encountered in contaminated areas and the costs for connecting with numerous operating systems throughout the plant. The latter will involve intricate coordinating with yet-to-be established schedules.

11. Method of Performance:

The responsibility for design and project management will be assigned to the INEL prime contractor as administered by DOE-Idaho. The construction will be accomplished by contracts and subcontracts awarded on the basis of competitive bidding.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test reactor area liquid radioactive waste cleanup system, phase III, Idaho National Engineering Laboratory (INEL), Idaho

2. Project No.: 87-D-177

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

a. Total project costs	Prior yrs.	FY 1987	FY 1988	FY 1989	FY 1990	Total
(1) Total facility costs						
(a) Construction line item	$ 0	$ 400	$ 1,100	$ 1,600	$ 2,400	$ 5,500
(b) PE&D	0	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total direct costs	0	400	1,100	1,600	2,400	5,500
(2) Other project costs						
(a) R&D necessary to complete construction	125	0	0	0	0	125
(b) Other project related costs .	0	0	0	0	100	100
Total other project costs ...	125	0	0	0	100	225
Total project costs (items 1 & 2)	$ 125	$ 400	$ 1,100	$ 1,600	$ 2,500	$ 5,725

b. Other related annual costs (estimated life of project: 20 years)

(1) Facility operating cost (annual)	$ 55
(2) Programmatic operating expenses directly related to the facility (annual)	75
(3) Capital equipment not related to construction but related to the programmatic effort in the facility	0
(4) GPP or other construction related to programmatic effort in the facility	0
(5) Other costs	0
Total other related annual costs	$ 130

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs
  (1) Total facility costs
    (a) Construction line item - cost to build this project.
    (b) PE&D - none requested.
    (c) Expense funded equipment - none requested.
    (d) Inventories - none required.

1. Title and location of project: Test reactor area liquid radioactive waste
cleanup system, phase III, Idaho National
Engineering Laboratory (INEL), Idaho

2. Project No.: 87-D-177

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements: (continued)

(2) Other project costs
  (a) R&D necessary to complete construction - to date, approximately $125,000 has been spent on conceptual design.
  (b) Other project related costs - approximately $100,000 will be spent for start-up testing, documentation revisions, training, and initial supplies.

b. Other related annual costs
  (1) Facility operating costs - the estimate includes additional labor, material, and energy costs to operate the facility which are not included in programmatic expenses below.

  (2) Programmatic operating expenses directly related to the facility - the estimate is based on the projected FY 1987 operating expenses for those TRA facility programs which produce liquid radioactive waste to be recycled by this project.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste & Byproducts Management

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Burial ground expansion, Savannah River, South Carolina
2. Project No.: 87-D-180

3. Date A-E work initiated: 1st Quarter FY 1987
5. Previous cost estimate: None

3a. Date physical construction starts: 3rd Quarter FY 1987
6. Current cost estimate: $14,500
Date: 4/85

4. Date construction ends: 3rd Quarter FY 1988

7. *Financial Schedule:

Fiscal Year	Authorization	Appropriations	Obligations	Costs
1987	$ 6,300	$ 6,300	$ 6,300	$ 5,100
1988	8,200	8,200	8,200	9,400

8. Brief Physical Description of Project:

This project provides for the design and construction of an approximately 100 acre expansion to the existing burial ground to meet present and forecasted requirements for radioactive waste disposal. This facility will meet the requirements and standards of waste management practices in DOE Order 5820.2.

The design basis facility location is north and northeast of the present burial ground. Site selection will be through the NEPA process. This project will include:

- Site preparation - clearing and leveling.
- Drainage.
- Monitoring.
- Security fencing.
- Standard heavy equipment (i.e., one small wide track bulldozer, one large bulldozer, two self elevating scrappers, one 150 ton shielded crane).
- Area security lighting.
- Railroad spur from adjacent tracks.
- Construction of initial waste disposal units. Further disposal units will be funded by Burial Ground operating funds.

*The accelerated schedule required for this project is achievable because the majority of project activities involve civil engineering and site improvement.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Burial ground expansion,
Savannah River, South Carolina

2. Project No.: 87-D-180

8. Brief Physical Description of Project: (continued)

Decommissioning cost of the 100 acre burial ground expansion is estimated to be $1,000,000 (FY 1985 dollars) at the end of the approximately 20 year expected life. Decommissioning will be in accordance with current acceptable practice.

FY 1987 funds will provide design, placing of purchase orders for long lead procurement items such as a crane and bulldozers, site preparation, and initial disposal units.

9. Purpose, Justification and Need for, and Scope of Project:

The existing burial ground will be filled by mid-1988 despite implementation of programs to incinerate waste and compact waste for more efficient space utilization.

The purpose of this project is to provide sufficient additional burial facilities to meet forecasted radioactive waste disposal requirements at Savannah River through approximately the year 2008.

Operation of improved confinement disposal facilities (grouted boreholes and an engineered trench with concrete stabilized waste), are required in order to improve waste management practices, and will result in better containment of radionuclides (e.g. tritium).

If this project is delayed or not approved, plutonium and tritium production at Savannah River will be curtailed because radioactive waste from these production processes must be immediately disposed of.

Immediate disposal is necessary because storage of radioactive waste presents safety and environmental problems.

The standard equipment is required for replacement of old equipment scheduled for retirement. Improved disposal methods require the ability to move and handle large amounts of soil efficiently.

10. Details of Cost Estimate: a/

	Item Cost	Total Cost
a. Engineering design & inspection at approximately 7.5% of construction costs.....................		$ 850
b. Construction costs............................		11,375
(1) Improvements to land......................	$ 5,420	
(2) Other structures - disposal/storage units...	2,680	
(3) Special facilities - monitoring wells.......	120	

a/ The above estimates are based on conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Burial ground expansion,
Savannah River, South Carolina

2. Project No.: 87-D-180

10. Details of Cost Estimate: a/ (continued)

		Item Cost	Total Cost
(4) Utilities - electrical		$ 655	
(5) Standard equipment		2,500	
(a) Small bulldozer (EWO)*	60		
(b) Large bulldozer (EWO)*	265		
(c) Two scrapers (EWO)*	700		
(d) 150 ton crane (EWO)*	1,475		
c. Contingency at approximately 15% of above costs.			1,825
d. Liaison costs			450
Total estimated costs			$ 14,500

*Estimate supplied by SRP (vendor quote).

11. Method of Performance:

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

1[illegible] Funding Schedule of Project Funding and Other Related Funding Requirements:

Prior Years	Prior Years	FY 1986	FY 1987	FY 1988	Total
a. Total project costs					
1. Total facility costs					
(a) Construction line item	$ 0	$ 0	$ 5,100	$ 9,400	$14,500
(b) PE&D	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0
(d) Inventories	0	0	0	0	0
Total facility costs	0	0	5,100	9,400	14,500
2. Other project costs					
(a) R&D	0	0	0	0	0
(b) Conceptual design & engineering studies	180	150	0	0	330
(c) Other project related costs	0	0	0	0	0
Total other project costs	180	150	0	0	330
Total project costs (item 1 & 2)	$ 180	$ 150	$ 5,100	$ 9,400	$14,830

1. Title and location of project: Burial ground expansion,
Savannah River, South Carolina

2. Project No.: 87-D-180

12. Funding Schedule of Project Funding and Other Related Funding Requirements: (continued)

b. Other related annual costs (estimated life of project: 20 years)

	Annual Cost
1. Facility operating costs	$ 200
2. Programmatic operating expenses directly related to the facility	500
3. Capital equipment not related to construction but related to the programmatic effort in the facility	200
4. GPP or other construction related to programmatic effort in the facility	100
Total other related annual funding requirements	$ 1,000

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs
   1. Total facility costs
      (a) Construction line item
      (b) PE&D - no PE&D funding is required.
      (c) Expense funded equipment - none.
      (d) Inventories - no inventories are needed for the proposed facilities.
   2. Other project costs
      (a) R&D - not required.
      (b) Conceptual design and engineering studies - $330,000 will provide preparation of a cost estimate for project authorization and performing sub-surface soils investigation and topographic survey.
      (c) Other project related costs - none.

b. Total related annual costs
   1. Facility operating costs - $200,000 (incremental cost) includes utilities, labor, and materials.
   2. Programmatic operating expenses directly related to the facility - Operating expenses to supply new waste disposal storage units as old units are filled.
   3. Capital equipment not related to construction but related to the programmatic effort in the facility - $200,000 includes replacement of old equipment.
   4. GPP or other construction related to programmatic effort - $100,000 includes expansion of personnel facilities.
   5. Other costs - none.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste & Byproducts Management

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Diversion box and pump pit containment buildings, Savannah River, South Carolina

2. Project No.: 87-D-181

3. Date A-E work initiated: 2nd Quarter FY 1987

5. Previous cost estimate: None

3a. Date physical construction starts: 1st Quarter FY 1988

6. Current cost estimate: $17,300
Date: 12/84

4. Date construction ends: 2nd Quarter FY 1990

7. Financial Schedule:

Fiscal Year	Authorization	Appropriations	Obligations	Costs
1987	$ 1,360	$ 1,360	$ 1,360	$ 700
1988	6,800	6,800	6,800	5,500
1989	6,350	6,350	6,350	7,500
1990	2,790	2,790	2,790	3,600

8. Brief Physical Description of Project:

This project will provide metal building enclosures over five existing radioactive waste transfer pump pit and diversion box facilities in the F and H Area waste tank farms.

Each building will have a remotely-operated bridge crane capable of completing all equipment change operations in diversion boxes or pump pits. The crane will be operated from a remote console outside each building. Remotely operated TV cameras will allow viewing of work underway.

Each building will have a ventilation system maintaining a lower than atmospheric pressure. Building exhaust will be through HEPA filters. The building ventilation system provides containment in addition to the existing process ventilation system and complies with design criteria outlined in DOE Order 6430. Airflow into each diversion box or pump pit will be 50 linear feet per minute when shielding covers are removed, to prevent spread of contamination.

This project will provide all the equipment required to perform all remote operations in the pump pits and diversion boxes.

1. Title and location of project: Diversion box and pump pit containment buildings, Savannah River, South Carolina

2. Project No.: 87-D-181

8. Brief Physical Description of Project: (continued)

Decommissioning costs for these buildings are estimated to be $1,000,000 (FY 87 dollars) at the end of the 30 year expected life. Decommissioning is expected to involve decontamination, dismantlement, and final disposal as radioactive waste at the Savannah River burial ground.

FY 1987 funds will provide design, initial construction work, and procurement of HEPA filters.

9. Purpose, Justification of Need for, and Scope of Project:

This project will prevent 5 to 6 weeks of lost operation per year after FY 1990 for the materials production program, waste management evaporators and DWPF. This project provides buildings and equipment to allow all weather, remote, contained work in diversion boxes and pump pits requiring frequent access and which have significant impact on materials production or waste management operations.

Justification for this project is based on the need to maintain operating continuity for interim waste tank farm operations, long-term waste operations (Defense Waste Processing Facility) and materials production in order to avoid costly shutdowns. Production schedules depend on timely maintenance and jumper and equipment changes in diversion boxes and pump pits to accommodate waste transfers.

By FY 1990, materials production and waste operations will be more dependent on timely work in diversion boxes and pump pits, especially after DWPF startup in 1989. The frequency of all types of waste transfers is increasing. This causes an increase in required maintenance and jumper changes. For the first time, production is becoming dependent on successful transfers between the two waste tank farms.

Existing diversion box and pump pit facilities are exposed to the weather. About 40 percent of all work in these facilities during 1983 was delayed due to high winds or inclement weather. Delays of as much as 2 weeks have occurred. Some delay is tolerable, but in 1983, three delays affected operation of materials production facilities.

These facilities will allow all-weather work in diversion boxes and pump pits. Statistically, without weather protection, more than 5 weeks of additional annual downtime could result for materials production facilities, waste tank farm evaporators and DWPF. With this project, the cost of saved downtime would be about $2,300,000 per year. The first year return on investment would be 13 percent.

About 100 intertank transfers per year will occur to support the waste transfer program and to provide feed to waste management evaporators. About 500 liquid waste transfers are made yearly from materials production facilities to waste management tank farms. Transfers between the tank farms will average 10 per year. About 15 transers per year, including 5 from F Area, will be made to waste tanks which feed the DWPF. These transfers are routed through diversion boxes and pump pits.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Diversion box and pump pit containment buildings, Savannah River, South Carolina

2. Project No.: 87-D-181

9. Purpose, Justification of Need for, and Scope of Project: (continued)

In addition, remote equipment provided by the project will reduce radiation exposure to operating personnel by about 15 REM per year. This represents a savings of more than 20 percent of the annual radiation exposure due to waste management operations.

If the project is delayed or not authorized, materials production facilities, waste tank farm evaporators and the DWPF may experience an estimated 5 to 6 weeks downtime per year.

10. Details of Cost Estimate:

Item		Item Cost	Total Cost
a. Engineering design & inspection at approximately 14% of construction costs 1/			$ 1,650
b. Construction costs			11,935
(1) Improvements to land		$ 365	
(2) Buildings		3,160	
(a) FDB2 and FPP1 4134 SF	$ 785		
(b) FDB4 and FPP2 and 3 4386 SF	825		
(c) HDB7 2200 SF	460		
(d) HPP5 and 6 3660 SF	675		
(e) HCTS PP 1665 SF	415		
(3) Special facilities		8,410	
(a) Equipment	5,755		
(b) Piping	345		
(c) Instruments	450		
(d) Electrical	1,860		
c. Removal costs			890
Subtotal			$ 14,475
d. Contingency at approximately 17% of above cost 2/			2,525
*e. AED allowance - design and construction liaison, checkout and acceptance 1/			300
Total estimated costs			$ 17,300

1/Engineering Design and AED allowance include a limited amount of inspection costs for special equipment. The majority of the inspection costs are reflected in construction costs, Item 10b.

2/Contingency is 17% to allow for uncertainties for construction in existing operating facilities, radiation zones and regulated areas.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Diversion box and pump pit containment buildings, Savannah River, South Carolina

2. Project No.: 87-D-181

11. Method of Performance:

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

Prior Years	Prior Years	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project costs							
1. Total facility costs							
(a) Construction line item	$ 0	$ 0	$ 700	$ 5,500	$ 7,500	$ 3,600	$17,300
(b) PE&D	0	0	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0	0
Total facility costs	$ 0	$ 0	$ 700	$ 5,500	$ 7,500	$ 3,600	$17,300
2. Other project costs							
(a) R&D	0	0	0	0	0	0	0
(b) Conceptual design	100	300	0	0	0	0	400
(c) Other project related costs	0	0	0	0	0	0	0
Total other project costs	100	300	0	0	0	0	400
Total project costs (Item 1 & 2)	$ 100	$ 300	$ 700	$ 5,500	$ 7,500	$ 3,600	$17,700

b. Other related annual costs (estimated life of project: 30 years)

	Annual Cost
1. Facility operating costs	$ 50
2. Programmatic operating expenses directly related to the facility	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility	50
4. GPP or other construction related to programmatic effort in the facility	0
Total other related annual funding requirements	$ 100

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Diversion box and pump pit containment buildings, Savannah River, South Carolina

2. Project No.: 87-D-181

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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs
    1. Total facility costs
        (a) Construction line item - this is for design, construction, and plant liaison.
        (b) PE&D - none.
        (c) Expense funded equipment - none.
        (d) Inventories - none.
    2. Other project costs
        (a) R&D - none.
        (b) Conceptual design and engineering studies - $400,000 for preparation of estimates for authorization.
        (c) Other project related costs -

b. Total related annual costs
    1. Facility operating costs - $50,000 for increased utility costs.
    2. Programmatic operating expenses directly related to the facility - none.
    3. Capital equipment not related to construction but related to the programmatic effort in the facility - $50,000 for replacing worn capital equipment.
    4. GPP or other construction related to programmatic effort - none.
    5. Other costs - none.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

1. Title and location of project: B-Plant F-filter, Richland, Washington

2. Project No.: 86-D-172

3. Date A-E work initiated: 2nd Quarter FY 1986

3a. Date physical construction starts: 1st Quarter FY 1987

4. Date construction ends: 4th Quarter FY 1988

5. Previous cost estimate: None

6. Current cost estimate: $4,000
Less amount for PE&D: 0
Net estimate: $4,000
Date: 3/84

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1986	$ 1,000	$ 949	$ 949	$ 435
sequestered 1986	0	(51)	(51)	(15)
1987	3,000	3,000	3,000	2,400
1988	0	51	51	1,165

8. Brief Physical Description of Project:

This project will provide a sixth filter cell (F-Filter) to serve B-Plant. F-Filter will incorporate features which help assure an estimated service life in excess of 15 years.

The filter will consist of an underground, reinforced concrete cell and above ground instrument building. The cell will house a minimum of four stages of high-efficiency particulate air (HEPA) filters which will be arranged and equipped to permit controlled bypassing of filters upstream of the two final filter banks at an appropriate time during operation.

The bypass mechanism will provide operating control of the Pressure Drop (PD) across the filter bank. Diverting a controlled amount of air around the filter bank reduces the PD and the filter can remain in service as a high efficiency prefilter. This is expected to extend the life of the downstream filter banks so as to achieve a service life in excess of 15 years.

The design of the project will be completed with the FY 1986 appropriation. Physical construction will be accomplished in FY 1987 and FY 1988.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: B-plant F-filter,
Richland, Washington

2. Project No.: 86-D-172

9. Purpose, Justification of Need for, and Scope of Project:

The B-Plant canyon exhaust filtration system is comprised of underground concrete cells equipped with prefilters, HEPA filters and an emergency back-up sand filter. At the present time the fourth filter cell (D-Filter) is in use and the fifth filter (E-Filter) has been built and waits off line as a spare. E-Filter will become the primary canyon filter when D-Filter reaches the end of its service life in FY 1987. The F-Filter is required to serve as a spare to E-Filter.

The sand filter exists as an emergency spare but is of inadequate capacity to support the plant's operating requirement of maintaining negative-to-atmosphere pressure in the canyon, thereby endangering the health and safety of operating personnel.

Experience with the A-, B-, C-, and D-Filter's rate of radiation accumulation shows that the expeditious repair of filters is impossible.

To maintain plant operating schedules and assure continued compliance with environmental release and health and safety standards, a sixth canyon filter is required.

If this project is not supported, a release to the environment could halt plant operations at a cost and schedule impact of approximately $40,000 per day, while at the same time endangering the health and safety of operating personnel.

10. Details of Cost Estimate: a/

	Item Cost	Total Cost
a. Engineering, design and inspection at approximately 26% of construction costs (item b)	$	$ 620
b. Construction costs		2,680
(1) Improvements to land	45	
(2) Building 3850 sq ft @ $590/sq ft	2,270	
(3) Utilities (including raw water lines electrical power and compressed air)	65	
(4) Special facilities (filter frames)	250	
(5) Standard equipment (HEPA filters)	50	
c. Contingency at approximately 21% of items a and b		700
Total estimated cost		$ 4,000

a/ This estimate is based on conceptual design effort that is 95% complete.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: B-plant F-filter,
Richland, Washington

2. Project No.: 86-D-172

11. Method of Performance:

Design and inspection will be performed by the onsite architect-engineer contractor. Construction and procurement will be performed by the onsite construction contractor (i.e., for excavation and tie-ins, etc., that involve "hot" work) and by an offsite contractor on a fixed price contract. The installation of filter assemblies shall be performed by the operating contractor, when E-Filter reaches the end of its service life.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

Not applicable to projects with a total estimated cost (TEC) of less than $5 million.

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

Not applicable to projects with a TEC of less than $5 million.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management
(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

1. Title and location of project: Low-level waste processing and shipping system, Feed Materials Production Center, Fernald, Ohio
2. Project No.: 86-D-174
3. Date A-E work initiated: 1st Quarter FY 1986
3a. Date physical construction starts: 4th Quarter FY 1986
4. Date construction ends: 4th Quarter FY 1988
5. Previous cost estimate: $17,000
Date: 5/84
6. Current cost estimate: $17,000
Less amount for PE&D 0
Net cost estimate $17,000
Date: 10/84

7. Financial Schedule:

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1986	$ 2,500	$ 2,372	$ 2,372	$ 1,400
sequestered 1986	0	(128)	(128)	0
1987	10,000	10,000	10,000	9,000
1988	4,500	4,628	4,628	6,600

8. Brief Physical Description of Project:

The low-level waste processing and shipping (LLWPS) system will be located mainly within Plant 8 at the Feed Materials Production Center (FMPC). This project will provide facilities to process liquid and solid low-level waste (LLW) into a form suitable for shipment and off-site disposal. More than 40 different waste streams, wet and dry, burnable and non-burnable, are generated at FMPC. Of these, two account for 80 percent of the waste generated, six account for 93 percent, and 14 account for 96 percent. The facility will be designed and sized to handle all major radioactive waste streams, and consists of two major subsystems: waste processing and waste packaging/shipping.

The waste processing subsystem may include: 1) a filtration unit to receive, store and dewater the two main wet waste streams from the plant; 2) a drying or immobilization unit, such as a rotary kiln, to dry, oxidize or otherwise stabilize several of the waste streams; 3) a roasting unit, such as an oxidation furnace, which will oxidize wastes which cannot be handled in the drying unit; 4) a solids handling unit, which will reduce the volume of large pieces of waste via crushing, shredding, and milling; 5) the Plant 8 collection unit, which will serve as a central collection point for solids from other points in the FMPC prior to packaging; and 6) the Plant 2 transfer unit, which will transport solids generated in Plant 2 to the Plant 8 collection unit.

8. Brief Physical Description of Project: (continued)

The waste packaging/shipping subsystem may include: 1) the Plant 8 drum filling unit, which will fill drums with waste, weigh the drums, and seal them; and 2) the Plant 8 drum washing unit, which will decontaminate the exterior surfaces of the filled and sealed drums prior to shipment.

The project also includes all necessary fire protection; safety; heating, ventilation, and air conditioning (HVAC) system; mechanical and electrical support; and environmental pollution monitoring and control systems.

9. Purpose, Justification of Need for, and Scope of Project:

Past waste management practices involved the use of large, lined pits for the storage of solid and liquid LLW. The use of waste pits is no longer acceptable and an alternate waste management strategy has been selected. Shipment and off-site disposal in an approved LLW disposal facility will ultimately eliminate the risk of local ground water contamination and provide permanent disposal of the waste as opposed to temporary storage, which is ultimately much more expensive.

Waste management problems have been intensified by the new National Pollutant Discharge Elimination System (NPDES) permit for National Lead of Ohio (NLO), Inc., that became effective on November 1, 1980, and which became more restrictive in 1984. Two immediate problems arise from these regulations: 1) the copper content of waste liquor and 2) the stringent future requirements for new solids retention facilities. These problems are interrelated, as are discharge problems with other materials covered by the NPDES permit.

The timing of this new facility is critical because the existing facilities are not adequate to process current or projected waste streams for shipping. Interim measures for processing and shipping the waste are being implemented to bridge the time period until permanent facilities are available. The interim facilities are used on a space-available basis. When not available, the unprocessed waste must be stored onsite in drums. The need for this facility is made even more critical when considering the waste management impacts of a planned doubling of plant output of nuclear materials by the end of 1987.

A lack of funding for this project will result in the inability to adequately process all FMPC waste streams for shipment and disposal. This will result in continued onsite storage of waste which does not meet disposal site waste acceptance criteria (about 75 percent of the waste).

1. Title and location of project: Low-level waste processing and shipping system,
Feed Materials Production Center, Fernald, Ohio

2. Project No.: 86-D-174

10. Details of Cost Estimate:

		Item Cost	Total Cost
a. Engineering, design, and inspection at approx. 16% of construction costs, item b.			$ 1,910
(1) Title I and II		$ 1,370	
(2) Title III		530	
(3) Project management		10	
b. Construction costs			11,710
(1) Land improvements		160	
(2) Building addition which includes fire protection, freight elevator and loading dock - 8,300 ft (squared) at $146/ft (sq'd) 167,000 ft (cubed) at $7.25/ft (cubed)		1,210	
(3) Special facilities		10,340	
(a) Rotary kiln	$2,600		
(b) Oxidation furnace	1,200		
(c) Mill	280		
(d) Shredder	250		
(e) Belt conveyor	180		
(f) Off-gas cleaning system	500		
(g) Other equipment and process-related work such as piping, lighting, power, instrumentation, HVAC, etc.	5,330		
c. Contingency, at approximately 25% of the sum of items a and b.			3,380
Total estimated costs			$ 17,000

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Low-level waste processing and shipping system, Feed Materials Production Center, Fernald, Ohio

2. Project No.: 86-D-174

11. Method of Performance:

Design and inspection will be on the basis of a negotiated architect-engineer contract. To the extent feasible, construction and procurement is to be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Yrs.	FY 1986	FY 1987	FY 1988	Total
a. Total project funding					
(1) Total facility costs					
(a) Construction line item............	$ 0	$ 1,400	$ 9,000	$ 6,600	$ 17,000
(b) PE&D............................	0	0	0	0	0
(c) Expense funded equipment..........	0	0	0	0	0
(d) Inventories.......................	0	0	0	0	0
Total facility costs........	$ 0	$ 1,400	$ 9,000	$ 6,600	$ 17,000
(2) Other project costs					
(a) Development necessary to complete construction............	408	0	0	0	408
(b) Other project related costs.......	290	0	0	0	290
Total other project funding.....	698	0	0	0	698
Total project funding (item 1 & item 2)..............	$ 698	$ 1,400	$ 9,000	$ 6,600	$ 17,698

b. Other related annual costs (estimated life of project: 20 years)

(1) Facility operating costs..	$1,323
(2) Programmatic operating expenses directly related to the facility.............	1,785
(3) Capital equipment not related to construction but related to the programmatic effort in the facility.................................	0
(4) GPP or other construction related to programmatic effort in the facility......	0
(5) Other costs..	0
Total related annual costs..	$3,108

1. Title and location of project: Low-level waste processing and shipping system,
Feed Materials Production Center, Fernald, Ohio
2. Project No.: 86-D-174

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project funding	
(1) Total facility costs	
(a) Construction line items	$17,000,000
(b) PE&D funding	Not applicable
(c) Expense funded equipment	Not applicable
(d) Inventories	Not applicable
(2) Other project funding	
(a) Development necessary to complete construction (includes $138,000 for preparation of the design criteria, preparation of the Project Management Plan, and other support activities. Also included is $270,000 for miscellaneous development items as identified in the CDR.	408,000
(b) Conceptual design engineering	290,000
b. Total annual related funding requirements	
(1) Facility operating costs (includes the cost of materials, wages, maintenance and other direct operating costs [e.g., packaging waste for shipment])	1,323,000
(2) Programmatic operating expenses directly related to the facility (includes the indirect and G&A costs applied to the maintenance and operating labor wages, as well as $1,076,000 for off-site shipping and $385,000 for disposal charges	1,785,000
(3) Capital equipment not related to construction but related to the programmatic effort in the facility	Not applicable
(4) GPP or other construction	Not applicable
(5) Other costs	Not applicable

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

1. Title and location of project: INEL security upgrade, Idaho National Engineering Laboratory (INEL), Idaho
2. Project No.: 86-D-175

3. Date A-E work initiated: 1st Quarter FY 1986

3a. Date physical construction starts: 3rd Quarter FY 1986

4. Date construction ends: 2nd Quarter FY 1988

5. Previous cost estimate: NONE
Less amount for PE&D:
Net cost estimate:
Date:

6. Current cost estimate: $10,000
Less amount for PE&D: 0
Net cost estimate: $10,000
Date: 3/85

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligations	Costs
1986	$ 2,000	$ 1,958	$ 1,958	$ 1,958
sequestered 1986	0	(42)	(42)	(42)
1987	7,300	7,300	7,300	7,000
1988	700	742	742	1,042

8. Brief Physical Description of Project:

This project provides for the design, procurement and construction of DOE Security facilities at several locations at Idaho National Engineering Laboratory (INEL) to replace the current security headquarters at the Central Facility Area (CFA) and to accommodate expanded security functions where required. Planned facilities include:

a. Vehicle access control guard stations

Certain access control guard station upgrading will be required for interfacing with other security system enhancements/ upgrades at the INEL.

b. INEL Security Complex

The INEL security complex will consist of a security headquarters building and a Special Response Team (SRT) headquarters. A security fence will be constructed around the security complex and access control provided. All areas will be well lighted and security alarmed.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: INEL security upgrade, Idaho National Engineering Laboratory (INEL), Idaho

2. Project No.: 86-D-175

8. Brief Physical Description of Project: (continued)

(1) Security headquarters building

This building will be provided with power, water, sewer, communications, a normal heating, ventilating, and air conditioning (HVAC) system, and a hardened central alarm system and armory.

It will house offices of the security force contractor, locker areas for men and women, training and conference rooms, and other required support areas.

The proposed new security headquarters building will include the following features:

(a) Security alarms and computer system functions.

(b) Emergency utilities and supplies for maintaining counter measure capability for extended periods when normal site support utilities are not available.

(2) SRT headquarters and response vehicle facilities

This facility will be a central response area located adjacent to the existing security Helicopter Maintenance Facility. It will house the SRT operations support areas and will include administrative offices, helicopter overhaul and parts area, a security vehicle garage with "ready line" parking, an armory and ammunitions storage area, and a lodging area with kitchen facilities for personnel and related equipment.

c. Security badging facility

The security badging facility will be constructed adjacent to the main guard station and will replace existing temporary trailers. The security badging facility will accommodate a badging counter, computer terminals, public restrooms, administrative office area, outside parking areas, and other improvements and modifications as needed.

d. Weapons range

The existing INEL weapons range will be upgraded to meet the needs of the enhanced security guard force. Such upgrades will include earth berming, lighting, communications, control towers, and weather shelters, as required. The range will be reconfigured as a multi-purpose range and stress course.

1. Title and location of project: INEL security upgrade,
Idaho National Engineering Laboratory (INEL), Idaho

2. Project No.: 86-D-175

9. Purpose, Justification of Need for, and Scope of Project:

This project is being requested consistent with the requirements identified in both the Safeguards and Security Master Plan for the DOE Idaho Operations Office dated April 16, 1984, and the INEL Five-Year Plan dated September 28, 1983. The purpose of this project is to replace and upgrade existing security-related facilities, both permanent and temporary to provide capacity for the expanding role of the security forces at the INEL. The INEL security force almost tripled in size during FY 1984, and many temporary measures have been implemented to handle this increase. Existing facilities have been stretched beyond their normal capacity to help meet the needs of the security forces. This project alleviates crowding and improves operating efficiencies.

The project is needed to enable the INEL to meet the guidelines of DOE Order 5632, Draft 10/11/84, on a continuing basis. Specifically included are the following:

A. Vehicle Access Control Guard Stations

These permanent, guard stations will replace existing, portable guard houses which were set up on a temporary basis during FY 1984 as security enhancements. These stations will meet DOE security requirements and will control INEL ingress and egress.

B. INEL Security Headquarters Complex

1. Security Headquarters Building

The present INEL security headquarters at CFA, which houses administrative offices and serves as the site security training center, does not meet DOE security requirements. Training facilities have been temporarily located in one building and two double-wide trailers near the present INEL security headquarters. This arrangement is inefficient and hampers communications. The existing headquarters building has the following inadequacies:

- With approximately 6,400 sq. ft. on two floors, it serves as the backup security response post for the primary site operating facilities; all security alarms from these facilities go to this building. Backup security action is currently dispatched from this location (i.e., SRT, helicopters, etc.).
- The existing space is not sufficient to provide the command post functions for expanded site security. Approximately 30% of the building is used for safeguards and security functions, and approximately 70% is used for administrative purposes.

1. Title and location of project: INEL security upgrade, Idaho National Engineering Laboratory (INEL), Idaho
2. Project No.: 86-D-175

9. Purpose, Justification of Need for, and Scope of Project: (continued)

- Neither the SRT support area nor the Response Vehicle Facility can be located within close proximity of the existing security headquarters because the headquarters is surrounded by nonsecurity- related facilities and aboveground utility lines. The existing security facility does not provide adequate support to the SRT.
- The existing security headquarters building was constructed in about 1950, with 600 sq. ft added in 1979. Recent safety audits have revealed several National Electrical Code (NEC) electrical wiring deficiencies of the same type that recently caused a fire in a similar building.

For reasons of operational efficiency, this building must be located in the main security complex rather than at the site of the existing building. A major portion of the overall day-to-day INEL security activities will be carried out in this facility, and the same personnel who manage the entire contractor guard force will be used in the main command post in the event of an emergency.

2. SRT Headquarters and Response Vehicle Facility

The training, directing, and support of SRT personnel will be headquartered in this facility. General office areas and helicopter maintenance support areas will also be provided. These functions are currently housed in trailers located next to the existing Helicopter Maintenance Facility. The distance between the buildings in the present arrangement increases response time and hinders effective communications.

An enclosed area for response vehicles will make these vehicles ready for operations on short notice. The current arrangement requires that these vehicles be kept in ready condition to ensure their availability in inclement weather.

3. Other Features

Barrier fencing and alarms will allow detection of intrusion into the INEL Security Complex. The additional access road will allow flexibility of exit paths for response vehicles. Remotely operated vehicle gates will provide vehicle access control capability.

Parking areas for security vehicles will support year-round operations at the INEL by increasing vehicle readiness in inclement weather.

C. Security Badging Facility

Located at the main site entrance, this building will house the personnel, equipment, and public facilities to perform badging and site indoctrination activities in support of INEL Access Control.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: INEL security upgrade, Idaho National Engineering Laboratory (INEL), Idaho	2. Project No.: 86-D-175

9. Purpose, Justification of Need for, and Scope of Project: (continued)

The badging function is mandatory to ensure that only authorized personnel are granted access to the INEL. The existing temporary badging facility, a double-wide trailer, is too small to accommodate all site entry related functions and was never intended to be a permanent facility.

D. Weapons Range

The existing firing range is not adequate to support new weaponry and state-of-the-art training. It has no utilities, and there are no restroom facilities in the area. Consequently, a new upgraded firing range will be required to correct these deficiencies.

Lighting will be added to allow night operation.

The proposed range will include control room areas for range activities to enhance operational safety.

10. Details of Cost Estimate: a/	Items Cost	Total Cost
a. Engineering, design, inspection and project administration at 21% of construction and equipment cost b/		$ 1,500
b. Construction costs		7,040
(1) Improvements to land--clearing and grading, roads and lighting	$ 1,360	
(2) Buildings--guard station, headquarters building, badging facility/vehicle garage and SRT facility	4,350	
(3) Other structures	0	
(4) Utilities--electrical, water and sewer	1,330	
c. Government-furnished equipment/materials - detection system, alarms, and communication system tie-ins		260
d. Removal cost less salvage		0
e. Contingency at approximately 14% of items a thru d		1,200
Total estimated costs		$ 10,000

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a/ Above estimates are based on conceptual design estimates which are 100% complete.

b/ ED&I costs include a $110,000 estimate for location survey and foundation analysis.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: INEL security upgrade,
Idaho National Engineering Laboratory (INEL), Idaho

2. Project No.: 86-D-175

11. Method of Performance:

Overall responsibility for design and construction will be assigned to the INEL prime contractor administerd by DOE-ID. The INEL contractor will provide technical direction of the design effort. Construction will be accomplished by subcontractors awarded on the basis of competitive bidding.

12. Funding Schedule of Project Funding and Other Related Requirements:

	Prior Years	FY 1986	FY 1987	FY 1988	Total
a. Total project cost					
(1) Total facility costs					
(a) Construction line item	$ 0	$ 1,958	$ 7,000	$ 1,042	$10,000
(b) PE&D	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0
(d) Inventories	0	0	0	0	0
Total direct costs	$ 0	$ 1,958	$ 7,000	$ 1,042	$10,000
(2) Other project costs					
(a) R&D necessary to complete construction	$ 0	$ 0	$ 0	$ 0	$ 0
(b) Conceptual design costs	100	0	0	0	100
(c) Other project related costs	0	0	0	0	0
Total other project costs	100	0	0	0	100
Total project costs (items 1 & 2)	$ 100	$ 1,958	$ 7,000	$ 1,042	$10,100

b. Other related annual costs (estimated life of project: 25 years)

(1) Facility operating costs	$ 300
(2) Programmatic operating expenses directly related to the facility	13,000
(3) Capital equipment not related to construction but related to the programmatic effort in the facility	500
(4) Maintenance, repair, GPP or other construction related to programmatic effort in the facility	950
Total related annual costs	$14,750

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of Project: INEL security upgrade,
Idaho National Engineering Laboratory (INEL), Idaho

2. Project No.: 86-D-175

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project cost a/
   (1) Total facility costs - construction line item - no narrative required.
   (2) Other project costs
      (a) Conceptual design costs - prior year expenditures totalling $100,000 for the development of project functional and operational requirements, security enhancement studies, feasibility studies, and conceptual design report completion.

b. Other related annual costs
   (1) Facility operating costs - the major elements comprising the annual operating estimated costs of $300,000 are utility costs, janitorial costs, and minor maintenance tasks.
   (2) Programmatic operating expenses directly related to the facility; $13,000,000 for INEL security guard contract - the INEL security contractor guard force will have direct and primary use of these facilities.
   (3) Capital equipment not related to construction is estimated to be $500,000 and includes vehicles, radios, surveillance equipment and other state-of-the-art security equipment.
   (4) $950,000 worth of maintenance, repair, GPP or other construction related to programmatic effort in the facility.

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a/ It is estimated the facility will be used 25 years for its programmatic use.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative in Whole Dollars.)

1. Title and location of project: Seventh calcined solids storage facility,
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratory, Idaho

2. Project No.: 85-D-157

3. Date A-E work initiated: 2nd Quarter FY 1985

3a. Date physical construction starts: 2nd Quarter FY 1985

4. Date construction ends: 3rd Quarter FY 1989

5. Previous cost estimate: $24,000
Date: 3/85

6. Current cost estimate: $23,300
Less amount for PE&D: 0
Net cost estimate: $23,300
Date: 12/85

7. Financial Schedule:

Fiscal Year	Authorization	Appropriations	Obligations	Costs
1985	$ 7,000	$ 7,000	$ 7,000	$ 532
1986	14,500	13,319	13,319	3,060
sequestered 1986	0	(1,181)	(1,181)	0
1987	800	800	800	5,470
1988	1,000	2,181	2,181	7,220
1989	0	0	0	6,953
1990	0	0	0	65

8. Brief Physical Description of Project:

This project provides for the construction of the Seventh Calcined Solids Storage Facility (CSSF). The facility will have a total storage capacity of approximately 65,000 cubic feet. The facility will be of sufficient volume to accommodate radioactive liquid waste processing at the Idaho Chemical Processing Plant (ICPP) until approximately FY 1994. The liquid waste produced from the reprocessing of irradiated, highly enriched uranium fuel elements by dissolution and solvent extraction will be converted to a granular solid in the New Waste Calcining Facility (NWCF) and stored in the CSSF.

1. Title and location of project: Seventh calcined solids storage facility,
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratory, Idaho

2. Project No: 85-D-157

8. Brief Physical Description of Project: (continued)

The Seventh CSSF and all associated utilities will be integrated with NWCF. The facility will consist of (1) facilities for primary and secondary containment of the calcined solids, (2) equipment rooms, (3) solids separation equipment, (4) instrumentation and controls, (5) solids transport lines and feed distribution system, (6) primary container vent system, (7) provisions for retrievability, (8) necessary safety features including shielding, (9) decay heat removal system, (10) High Efficiency Particulate Air (HEPA) filtration systems, (11) air radiation monitoring systems, and (12) support facilities such as cathodic protection.

Stainless steel bins will provide the primary containment and a concrete vault will provide the secondary containment for the calcined solids. The vault, which will be largely below ground, will also provide the necessary radiation shielding. It will have several separate enclosed shielded rooms on top. These rooms will contain a solids separator, block valves as part of the transport air system, forced air blowers, HEPA filters, and instrumentation.

After filling, the bins will be vented through the bin vent system. All vented air will be filtered prior to discharge to the atmosphere and the fission product release will be well below the Federal emission standards. The bin vault cooling air will be rough filtered prior to entering the vault and will normally be discharged unfiltered through a stack by either natural or forced convection. This air will be monitored continuously for airborne radioactive particulates. Should the monitor detect radioactive particulates, the control system will automatically start a forced air blower and will automatically divert the cooling air through HEPA filters.

The solids storage facility will include provisions for retrieval of the calcined solids for possible shipment to a geologic repository if this becomes desirable.

9. Purpose, Justification of Need for, and Scope of Project:

Radioactive liquid wastes are produced from the reprocessing of spent reactor fuel at the ICPP. A major portion of this spent fuel is from Navy propulsion reactors. The NWCF converts highly radioactive liquid waste to granular solids by calcination. This CSSF project will provide facilities for safe and economical storage of the radioactive calcined solids. Additional calcined solids storage is required if the NWCF is to continue operation after 2nd quarter FY 1990. In order to meet this programmatic need date and continue reduction in the inventory of the high-level radioactive liquid waste tanks, fabrication of the bins must commence in FY 1985. Fabrication at that time is necessary to guarantee their delivery to meet the construction schedule. A delay in funding would cause the programmatic need date to be missed.

Should the NWCF and ICPP be shut down due to lack of waste storage, the Navy's nuclear program would be adversely affected. Shutdown would also defer recovery of valuable enriched uranium resources and the return of these resources to productive use.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Seventh calcined solids storage facility,
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratary, Idaho

2. Project No.: 85-D-157

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9. Purpose, Justification of Need for, and Scope of Project: (continued)

A year delay in funding for the Seventh CSSF would necessitate a shutdown of the NWCF for approximately 9 months. This would mean that approximately 1,260 cubic meters of high-level radioactive liquid waste would not be processed during this time. This increase in liquid waste would not affect the dissolution and extraction processes. The delay, however, would increase the funding requirement for the project by approximately $1.75 to 2 million due to escalation costs. The programmatic scheduling of operating personnel at the NWCF facility would also be affected.

Continued fuel reprocessing at the ICPP without waste calcination would require construction of additional high-level radioactive liquid waste tanks. However, additional liquid waste storage is not acceptable because of economic, safety, and environmental factors. Storage of high-level radioactive waste in the liquid form has a significantly higher risk of leakage of fission products to the environment. Conversion of high-level waste to solids for subsequent storage provides: (a) improved safety, (b) greater assurance of isolation from man's environment, (c) minimal reliance on continued maintenance and surveillance, (d) lower overcosts for waste management, and (e) reduced volume storage requirement (reduction in volume of about 7:1).

Fiscal year 1987 obligations are required for project administration, inspection and construction required to tie in the Seventh CSSF to the NWCF.

10. Details of Cost Estimate: a/ b/

	Item Cost	Total Cost
a. Engineering, design, inspection and project management at 18% of construction costs, item b		$ 3,000
b. Construction costs		16,950
(1) Improvements to land	$ 620	
(2) Building and other structures	9,740	
(3) Utilities	90	
(4) Special facilities	6,500	
c. Contingency @ approximately 20% of items a and b		3,350
Total project costs		$23,300

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a/ The above estimates are based on conceptual design that is 100% complete. Advanced conceptual design was completed in FY 1984.

b/ Escalation rate of approximately 6.5% applied based on DOE approved guidelines.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Seventh calcined solids storage facility, Idaho Chemical Processing Plant, Idaho National Engineering Laboratory, Idaho

2. Project No.: 85-D-157

11. Method of Performance:

The design work will be accomplished by an outside architect engineer in conjunction with the operating contractor to the extent feasible. Construction and procurement will be accomplished by a fixed-price contract and awarded on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

a. Total project cost	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	Total
(1) Total facility cost									
(a) Construction line item	$ 0	$ 532	$ 3,060	$ 5,470	$ 7,220	$ 6,953	$ 65	$ 0	$ 23,300
(b) PE&D	0	0	0	0	0	0	0	0	0
(c) Expense funded equipment ..	0	0	0	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0	0	0	0
Total facility costs	0	532	3,060	5,470	7,220	6,953	65	0	23,300
(2) Other project costs									
(a) R&D necessary to complete construction	306	0	0	0	0	0	0	0	306
(b) Other project related costs	0	275	364	367	386	202	140	120	1,854
Total other project costs .	306	275	364	367	386	202	140	120	2,160
Total project costs	$ 306	$ 807	$ 3,424	$ 5,837	$ 7,606	$ 7,155	$ 205	$ 120	$ 25,460

b. Other related funding requirements

(1) Facility operating costs (annual)	$ 35
(2) Programmatic operating expenses* directly related to the facility	0
(3) Capital equipment not related to construction but related to the programmatic effort in the facility	0
(4) GPP or other construction related to programmatic effort in the facility	0
(5) Other costs	0
Total other related annual funding requirements	$ 35

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*Operating costs and programmatic effort for NWCF will not change from that presently budgeted after construction of this facility.

1. Title and location of project: Seventh calcined solids storage facility,
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratory, Idaho

2. Project No.: 85-D-157

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs

(1) Total facility costs

(a) Construction line item - no narrative required.
(b) PE&D - no narrative required.
(c) Expense funded equipment - no narrative required.
(d) Inventories - no narrative required.

(2) Other project costs

(a) R&D necessary to complete construction - funding in this category was required for conceptual design. Total conceptual design costs were $306,000.
(b) Other project related costs - the funding in this category is for project support that is necessary during design and construction and for training and startup costs.

b. Other related annual costs

(1) Facility operating cost - annual operational cost while filling the bins is estimated at $35,000. After the bins have been filled, surveillance and maintenance costs are estimated at $25,000 per year for 5 to 10 years. After this period, annual costs will be negligible.

(2) Programmatic operating expenses related to the facility - operating costs and programmatic effort for NWCF which this facility supports will not change from that presently budgeted when this facility is constructed.

(3) Capital equipment not related to construction but related to the programmatic effort in the facility - no narrative required.

(4) GPP or other construction related to the programmatic effort - no narrative required.

(5) Other costs - no narrative required.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

1. Title and location of project: Central warehouse upgrade, Richland, Washington
2. Project No.: 85-D-158

3. Date A-E work initiated: 2nd Quarter FY 1985
5. Previous cost estimate: None

3a. Date physical construction starts: 2nd Quarter FY 1986
6. Current cost estimate: $13,000
Less amount for PE&D: 0
Net cost estimate: $13,000
Date: 3/84

4. Date construction ends: 2nd Quarter FY 1988

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligation	Costs
1985	$ 700	$ 700	$ 700	$ 0
1986	5,000	4,744	4,744	2,760
sequestered 1986	0	(256)	(256)	(90)
1987	5,500*	5,500*	5,500*	7,684
1988	1,800	2,056	2,056	2,556

8. Brief Physical Description of Project:

This project will provide a new warehouse facility for the Hanford Site. Included in the project is the construction of approximately 133,000 square feet of warehouse area, approximately 22,500 square feet of office space, and the required site work (parking lots, utilities, and drainage systems) necessary to operate the facility. Where appropriate, support furnishings and moveable equipment will be relocated from the existing building to the new building. Additional equipment as required will be furnished by the project.

As currently planned, the project scope will include the following:

a. Improvements to land

The replacement warehouse will be located on a vacant lot near the existing Central Warehouse Building. Sufficient parking to accommodate building occupants will be provided. The entrances to Route 4 South from the warehouse will be designed consistent with standard plans for highway design.

*Actual FY 1987 BA request is $1,300,000. Assumes $4,200,000 will be provided through reprogramming from Project 83-D-157.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central warehouse upgrade,
Richland, Washington

2. Project No.: 85-D-158

8. Brief Physical Description of Project: (continued)

b. Buildings

(1) Central warehouse building

The warehouse building will consist of a warehouse/office area on the first floor and an office area on a mezzanine (approximately 22,500 sq. ft.).

(2) Flammable storage building

A building approximately 5,000 square feet will be erected to store flammable materials and liquids.

c. Other structures

(1) Nitrogen bottling facility

The existing storage tank will be relocated by this project. A building of approximately 500 square feet will be erected adjacent to this tank.

d. Special facilities and equipment

Special facilities and equipment currently envisioned include dock levelers, truck scales, pallet rack, dock shelters and cool room for required refrigerated storage.

e. Utilities

Utilities required for the operation of the warehouse will be provided. Utilities currently envisioned include: electrical power, communication system (telephones), fire alarm system, sanitary and fire water supply, sanitary sewer, storm sewer and natural gas supply.

The 1987 appropriation will be used to continue construction.

9. Purpose, Justification of Need for, and Scope of Project:

The primary warehouse and stores facility for the Hanford Site has major structural, electrical and mechanical problems as well as built-in operational inefficiencies.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Central warehouse upgrade, Richland, Washington
2. Project No.: 85-D-158

9. Purpose, Justification of Need for, and Scope of Project: (continued)

Cost analysis indicates that rehabilitation of the structure, heating and insulation system, sprinkler system and lighting would cost approximately 65% of the replacement cost of the building. That expenditure would not resolve the space problems requiring leased space and the use of trailers as offices. Potential operational savings of approximately $230,000 per year would not be realized due to the current warehouse clear heights and configuration.

A history of structural problems, normally roof structural member failures, has been experienced in the existing building. The roof truss system had to be reinforced in 1962. In 1973, there was a partial collapse of the roof. Since the collapse, regular inspections have been made of the entire truss system. Individual truss members have been reinforced or replaced following the inspections. In 1976, in order to limit wall movement, external structural steel wall braces were placed on the south wall and horizontal structural steel trusses were installed along the outer walls. In 1978, approximately 40 roof trusses were replaced or reinforced and all the concrete walls were repaired to limit rebar corrosion.

These repairs and modifications have had limited success in reducing the number of recurring cracks in the walls and pilasters. However, they do not increase the load capacity of the roof. The 1981 inspections of the roof support truss system increased the concerns, and braces and trusses had to be stiffened with the addition of steel plates to the wood braces. The 1983 inspection continued to highlight the structural deficiencies of the building for the following reasons:

- Existing sags in the roof deck allow rain water to pond 4 to 5 inches deep. The weight of the accumulated water could further sag the deck and increase the load on the roof and further exceed the 20 PSF live load capacity of the roof system. Personnel are dispatched to remove standing water and/or snow. However, this cannot always prevent the short term overload of the roof.
- The existing structure does not satisfy the seismic regulations of the Uniform Building Code and would fail under low lateral forces.
- Wood members of the roof structure have deteriorated due to overstress, weathering, and leakage, resulting in unknown actual strength.
- The structure is too flexible to limit wind deflections which result in cracks in the walls and leaks in the built-up roof.

A recent inspection of the electrical system showed signs of deteriorated insulation on existing circuit wiring. The lighting in the storage areas is by incandescent lamps that provide a level of illumination of approximately 5 foot candles (F.C.), which is well below the minimum recommended light level of 20 F.C.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Central warehouse upgrade, Richland, Washington — 2. Project No.: 85-D-158

9. Purpose, Justification of Need for, and Scope of Project: (continued)

The existing walls and ceiling also are not insulated, resulting in excessive energy consumption for heating and cooling. During the summer, the warehouse is ventilated with ceiling mounted ventilators that function by air convection, and by opening exterior overhead doors. The building is closed in the evenings and on weekends. The heat during these closed periods causes the temperature to rise in excess of 150 degrees F near the ceiling when the ambient temperature reaches 105 degrees F. The offices are cooled with evaporative coolers and individual air conditioners. The offices within the warehouse exhaust the heat from their air conditioners directly into the warehouse, compounding the ventilation problem.

Building heating is provided by the originally installed oil-fired steam boiler. Recurring malfunctions and general maintenance of the system indicate the need for replacement. The existing system is inefficient compared to current technology. A heating system retrofit has been previously proposed as an energy conservation project.

The sprinkler system has had only limited upgrade since installation almost 30 years ago. The water lines to the sprinkler system are old and corroded and require replacement. Additionally, a recent fire protection survey indicated that the building did not conform to National Fire Code requirements.

Inadequate office and warehouse space has resulted in the need to rent warehouse space and install trailers for office space. Renting permanent space is not cost-effective.

The uncertainty of the load-carrying capacity of the roof under high wind conditions, as well as the known potential to accumulate roof overload during rain and snow storms, is cause for concern for the safety of the occupants and the protection of the material in the building.

10. Details of Cost Estimate: a/

	Item Cost	Total Cost
a. Engineering, design and inspection at approximately 7% of construction ...		$ 768
b. Construction costs		10,457
(1) Site work - excavating, grading, drainage paving, parking, fencing, exterior lighting, pedestrian access walks, landscaping, relocation	$ 460	
(2) Buildings - insulation, heating, air conditioning, doors, windows, concrete, finishes	8,800	
(a) Warehouse - 133,000 ft^2 @ $52/$ft^2$		
(b) Office - 22,500 ft^2@ 84/ft^2		

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a/ The above estimates are based on conceptual design that is 100% complete.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central warehouse upgrade, Richland, Washington

2. Project No.: 85-D-158

10. Details of Cost Estimate:

	Item Cost	Total Cost
(3) Other Structures - nitrogen facility	$ 90	
(4) Utilities - electrical, air, water, and gas service	540	
(5) Special equipment - (such as dock leveler, weigh scales bins and racks)	500	
(6) Warehouse stock and equipment move	67	
c. Contingency at approximately 16% of items a and b		1,775
Total estimated costs		$ 13,000

11. Method of Performance:

Design will be accomplished by an offsite architect-engineer contractor. Construction and procurement will be fixed price awarded on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior yrs.	FY 1985	FY 1986	FY 1987	To Complete	Total
a. Total project costs						
(1) Total facility costs						
(a) Construction line item	$ 0	$ 0	$ 2,760	$ 7,684	$ 2,556	$13,000
Total direct costs	$ 0	$ 0	$ 2,760	$ 7,684	$ 2,556	$13,000
(2) Other project costs						
(a) R&D necessary to complete construction	$ 237	$ 0	$ 0	$ 0	$ 0	$ 237
(b) Other project related costs .	0	100	$ 80	70	0	250
Total other project costs	237	100	80	70	0	487
Total project costs (Item 1 & 2)	$ 237	$ 100	$ 2,840	$ 7,754	$ 2,556	$13,487

b. Other related annual costs (estimated life of project: 25 years)

(1) Facility operating costs	$ 50*
(2) Programmatic operating expenses directly related to the facility	0
Total related annual costs	$ 50

*This compares with $184,000 current facility operating costs.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central warehouse upgrade,
Richland, Washington

2. Project No.: 85-D-158

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs
    (1) Total facility
        (a) Construction line item - no narrative required.

    (2) Other project costs
        (a) R&D necessary to complete construction - the conceptual design effort for this project is $237,000.
        (b) Other project related costs associated with project support and management, and design review are estimated to be $250,000.

b. Other related annual costs - it is estimated the facility will be used 25 years for its programmatic purpose.

    (1) Facility operating costs - after installation, there will be minor operating costs involving maintenance and repair activities estimated to be $50,000.

    (2) Programmatic operating expenses directly related to the faciity - the facility will have an annual operating budget of approximately $8,400,000, which is liquidated to other projects and contractors through material overhead.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and location of project: New waste transfer facilities,
Savannah River, South Carolina

2. Project No.: 85-D-159

3. Date A-E work initiated: 1st Quarter FY 1985

3a. Date physical construction starts: 1st Quarter FY 1986

4. Date construction ends: 3rd Quarter FY 1989

5. Previous cost estimate: $45,000
Date: 1/83

6. Current cost estimate: $41,000 a/
Date: 3/85

7. Financial Schedule:

Fiscal Year	Authorization	Appropriations	Obligations	Costs
1985	$ 11,000	$ 11,000	$ 11,000	$ 7,668
1986	9,000	8,118	8,118	9,260
sequestered 1986	0	(882)	(882)	(540)
1987	8,200	8,200	8,200	9,132
1988	12,800	13,682	13,682	11,240
1989	0	0	0	3,700

8. Brief Physical Description of Project:

This project will replace an existing obsolete diversion box/pump pit waste transfer facility with one of current design. This facility is designed to transfer waste between the type III tanks in the east and west H-Area waste tank farms and between F and H Areas. This facility has the capability included in the design to transfer and receive waste from the Defense Waste Processing Facility (DWPF). This project will include all required transfer piping and equipment, instrumentation and controls to operate this system safely and within current operating technical standards.

This facility will consist of a new diversion box with jumpers and service piping. The diversion box will provide 11 transfer lines to existing facilities and eight lines for future long-term waste programs. The lines will be stainless steel core and carbon steel jacket, both designed for long-stress cycle life. In conjunction with this diversion box, four pump pits similar to those provided on project 79-7-K will be constructed. These pump pits will be equipped with pump tanks, separable overhung shaft pumps, emergency transfer jets, sump jets, agitators, cooling coils and associated pump pit instrumentation.

a/ Reflects reduction for escalation and contingency plus addition of new scope to replace obsolete evaporator feed system.

1. Title and location of project: New waste transfer facilities, Savannah River, South Carolina

2. Project No.: 85-D-159

8. Brief Physical Description of Project: (continued)

The pump pits and diversion box will be of current design with all stainless steel liner and underliner leak detection capabilities. Service tie-ins include steam, electrical, emergency power, plant air, instrument air, breathing air, cooling water, flush water, and domestic water. All gang valves will be motorized mechanical gang valves with remote and local operations capabilities. Alarms and controls for this diversion box and pump pit complex will be in a control room provided by an earlier project. A ventilation system conforming to current design standards will be provided. Area lighting and communications will also be provided.

The new complex will be enclosed in a metal building with a remotely operated bridge crane in the building. This will permit repair work and equipment changes to be performed during inclement weather, thus minimizing the amount of time the complex will be out of service, and hence, potential impacts on production and waste management operations.

The new transfer complex will comply with all applicable criteria for a nuclear facility and be designed to reduce radiation exposure to operating and maintenance personnel to levels as low as reasonably achievable (ALARA). Design and components will be such that maintenance is minimal.

Also included in this project for FY 1987, will be the replacement of an obsolete evaporator feed system using a type II tank in H-Area with a new system using a high-integrity type III tank. This will provide:

o Feed and vent lines with secondary containment to the type III tank

o Vent line cleanout ports with drain lines

o Leak detection boxes with drain lines

o Installation of a feed pump in the type III tank

o Service tie-ins

o One spare feed pump

o Retirement of the existing feed system

9. Purpose, Justification of Need for, and Scope of Project:

The purpose of this project is to replace an existing diversion box/pump pit waste transfer facility and to replace an existing waste evaporator feed system.

1. Title and location of project: New waste transfer facilities,
Savannah River, South Carolina
2. Project No.: 85-D-159

9. Purpose, Justification of Need for, and Scope of Project: (continued)

A new waste transfer facility will be required in FY 1989 to continue H-Area tank farm operations after type I, II, and IV waste tanks are retired from service and to interface with the DWPF. The new facility is justified for two reasons:

o Replaces existing obsolete waste transfer complex. A 25-year-old waste transfer complex connects two sets of type III tanks in H-Area and ties into F-Area transfer lines.

The existing complex lacks full height stainless steel cell liners, jacketed transfer line wall penetrations and full leak detection capability which are included in current design criteria for secondary containment of radioactive waste. Transfer lines into and out of the existing complex have only a concrete encasement and catch tank for secondary containment. All other transfer lines located in this concrete encasement will be abandoned upon retirement of type I tanks in H-Area.

The existing ventilation system does not meet current design criteria for preventing an atmospheric release of radioactivity. Also, the pump pits are not designed to accept the new separable overhung shaft pump which reduces radiation exposure to personnel.

For these reasons, a replacement transfer facility is required. To reduce radiation exposure and contamination potential associated with such facilities, an enclosure and overhead crane in the new facilities will be provided. The enclosure will also permit work in the complex during inclement weather, thus minimizing the amount of time the complex will be out of service, and avoiding potential impacts on production and waste management operations.

o Expands H-Area transfer facilities for DWPF. The DWPF will create new requirements, for waste transfer facilities, which will be met by this project. In addition to increased waste transfers from F to H Area, transfers of large amounts of contaminated waste from DWPF to H-Area and waste from H-Area to DWPF will be made daily. The new Waste Transfer Facility must be operating in time to interface with DWPF in FY 1989, because the existing transfer facility does not have enough nozzle penetrations to accommodate these new lines.

The new evaporator feed system is justified for the following reasons:

o The existing feed tank is the only type I, II, or IV waste tank in critical-need service. Two cracks have been found in the tank. The most recent crack, found in 1980, restricts the tank fill limit.

1. Title and location of project: New waste transfer facilities,
Savannah River, South Carolina
2. Project No.: 85-D-159

9. Purpose, Justification of Need for, and Scope of Project: (continued)

- Retirement of the existing feed tank is required as part of the waste transfer program. Continued use of the type II tank as an evaporator feed tank will delay the waste transfer schedule by 3 years.

- The top of the existing feed tank is a high radiation area due to a recent waste spill. The new evaporator feed system will reduce H-Area waste operations radiation exposure by five percent.

10. Details of Cost Estimate:

		Item Cost	Total Cost
a. Engineering, design and inspection at approximately 27% of construction costs, item B.			$ 7,555
b. Construction costs.			28,550
(1) Improvements to land.		$ 565	
(a) Excavation, backfill and finish grading	210		
(b) Roads, parking lot and sidewalk	270		
(c) Lighting.	45		
(d) Fence and gates	40		
(2) Buildings		1,740	
(a) Diversion box and pump pit building, 10,250 sq ft	1,500		
(b) Pump pit ventilation building, 670 sq ft.	130		
(c) Process ventilation building, 600 sq ft	110		
(3) Other structures.		6,390	
(a) Concrete diversion box and pump pit cells with stainless steel liner	5,765		
(b) Pit dewatering.	315		
(c) Pit sheet piling.	310		
(4) Special facilities.		17,135	
(a) Process equipment	3,805		
(b) Power and H&V equipment	280		
(c) Ductwork.	220		
(d) Electrical.	825		
(e) Instruments	960		
(f) Process piping.	5,790		
(g) Process jumpers	985		

1. Title and location of project: New waste transfer facilities, Savannah River, South Carolina
2. Project No.: 85-D-159

10. Details of Cost Estimate: (continued)

		Item Cost	Total Cost
(h) Waste transfer pipe	4,175		
(i) Spare equipment	95		
(5) Utilities		2,720	
(a) Railroad relocation	740		
(b) Storm sewers	255		
(c) Fire protection	40		
(d) Outside service piping	1,655		
(e) Communications	30		
c. Standard equipment			25
(1) Health protection equipment		25	
d. Removal costs/maintaining production			170
Subtotal			36,300
e. Contingency at approximately 11% of above costs			4,200
f. Allowance for design and construction liaison, checkout and acceptance			500
Total project cost			$ 41,000

1/ Engineering design (item 10a) and AED allowance (item 10f) include a limited amount of inspection costs for special equipment. The majority of the inspection costs are reflected in construction costs (item 10b).
2/ Conceptual design is 100% complete.

11. Method of Performance:

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: New waste transfer facilities,
Savannah River, South Carolina

2. Project No.: 85-D-159

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
a. Total facility costs							
(1) Total facility costs							
(a) Construction line item............	$ 0	$ 7,668	$ 9,260	$ 9,132	$11,240	$ 3,700	$41,000
(b) PE&D..............................	0	0	0	0	0	0	0
(c) Expense funded equipment..........	0	0	0	0	0	0	0
(d) Inventories.......................	0	0	0	0	0	0	0
Total facility costs..................	0	7,668	9,260	9,132	11,240	3,700	41,000
(2) Other projects costs							
(a) R&D necessary to complete construction......................	0	0	0	0	0	0	0
(b) Conceptual design.................	625	50	0	0	0	0	675
(c) Other project related cost........	300	0	0	0	0	0	300
Total other project funding........	925	50	0	0	0	0	975
Total project funding.............	$ 925	$ 7,718	$ 9,260	$ 9,132	$11,240	$ 3,700	$41,975

b. Total related funding requirement (estimated life of facility: 40 years) (FY 1985 dollars)

	Annual Cost
(1) Facility operating costs..	$ 100
(2) Programmatic operating expense directly related to the facility........................	0
(3) Capital equipment not related to construction but related to the programmatic effort in the facility..	0
(4) GPP or other construction related to programmatic effort in the facility.................	0
Total other related annual funding requirements....................................	$ 100

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs
   (1) Total facility costs
      (a) Construction line item - includes costs for the construction project.
      (b) PE&D - none required.
      (c) Expense funded equipment - none required.
      (d) Inventories - none are needed for the proposed facilities.

1. Title and location of project: New waste transfer facilities,
Savannah River, South Carolina
2. Project No.: 85-D-159

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements: (continued)

(2) Other project costs
    (a) R&D not required.
    (b) Conceptual design and engineering studies totalling $675,000 includes preparation of a cost estimate for project authorization and improving equipment design.
    (c) Other project related costs - plant liaison prior to authorization totals $300,000.

b. Total related funding requirements
    (1) Facility operating costs - includes incremental costs for utilities and supplies of $100,000.
    (2) Programmatic operating expenses directly related to the facility - none.
    (3) Capital equipment not related to construction but related to the programmatic effort in the facility - none.
    (4) GPP or other construction related to programmatic effort - none.
    (5) Other costs - none.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

1. Title and location of project: Test reactor area security system upgrade, Idaho National Engineering Laboratory (INEL)

2. Project No.: 85-D-160

3. Date A-E work initiated: 2nd Quarter FY 1985

3a. Date physical construction starts: 3rd Quarter FY 1985

4. Date construction ends: 1st Quarter FY 1988

5. Previous cost estimate:	$7,000
Less amount for PE&D:	0
Net estimate:	$7,000
Date: 1/83	

6. Current cost estimate:	$7,000
Less amount for PE&D:	0
Net estimate:	$7,000
Date: 1/84	

7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligations	Costs
1985	$ 2,000	$ 2,000	$ 2,000	$ 350
1986	2,250	2,203	2,203	2,276
sequestered 1986	0	(47)	(47)	0
1987	2,750	2,750	2,750	2,388
1988	0	47	47	1,986

8. Brief Physical Description of Project:

The TRA Security Upgrade project includes four subprojects: 1) TRA Perimeter Protection, 2) TPA Access Control, 3) Nuclear Materials Inspection and Storage (NMIS) Facility Upgrade, and 4) Security Alarm, Control Station and Computer Systems.

Subproject I - TRA Perimeter Protection

a. TRA Perimeter Fencing

The existing TRA perimeter fence will be removed and replaced with a double fence enclosing a monitored sterile zone. The inner fence line will be comprised of a continuous line of reinforced concrete median barriers. The inner fence line will deter intrusion of unauthorized personnel and of wheeled vehicles into TRA and the outer fence will prevent the intrusion of animals or wind-blown debris into the sterile zone.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test reactor area security system upgrade, Idaho National Engineering Laboratory

2. Project No.: 85-D-160

8. Brief Physical Description of Project: (continued)

b. Vehicle Entry (VE)

The Vehicle Entry (VE) will control vehicles entry and egress through the TRA perimeter, and provide for positive containment during vehicle inspection and search operations. Monitoriing equipment will be incorporated to survey vehicles for contraband, explosives, or any unauthorized items. Motor-operated personnel and vehicle barriers will be incorporated for positive control. Access control of vehicle drivers will also be provided for through the VE.

c. Perimeter Intrusion Detetion System

Independent intrusion detection systems will be installed in the sterile zone. Signals from each zone will be multiplexed and transmitted to the Security Alarm and Control System (SACS) where they will be monitored. Perimeter alarm assessment will be provided by standard fast-scan video cameras; one for each alarm zone. The cameras will be compact, self-contained units. Operation of the cameras will be fully automatic and automatic sensitivity controls will adjust for the anticipated brightness levels. The cameras will be protected from, and operate in extremely low or high temperatures, high winds, rain, snow, and other severe weather conditions. The perimeter lighting system will be positioned to project light over the sterile zone. In addition, lighting will be provided to assure Closed Circuit Television (CCTV) surveillance of both the front and rear of the Access Control Facility (ACF).

An emergency vehicle access control point will be constructed in the vicinity of the existing emergency evacuation gate on the east parimeter to permit rapid passage of emergency vehicles (fire engines, ambulances, etc.) into TRA. Control of the fence gate and delta barrier will be from the SACS.

Subproject II - TRA Access Control

a. TRA Access Control Facility (ACF)

The TRA ACF will be a one story building and the exterior structure will be of precast, reinforced concrete construction. The ACF will serve as the access control point for all personnel entering or leaving the TRA area with the exception of vehicle drivers. The ACF will also serve as the reception area for all visitors.

b. Access Control

The Access Control (AC) will be a hardended room with the access and egress granted only be means of card readers. The card reader controlled access doors will be glass revolving, 4-wing doors which will automatically lock in response to a contraband detection system alarm (in the affected lane), or from a manual signal transmitted from the Access Control Systems (ACS) or guard stationed in the access control lane.

1. Title and location of project: Test reactor area security system upgrade, Idaho National Engineering Laboratory — 2. Project No.: 85-D-160

8. Brief Physical Description of Project: (continued)

c. Computer Terminal/Printer

A computer terminal linked to th SACS computers will be provided at a remote location to enter visitor/pass data into personnel accountability records. A high speed printer will be installed in the ACS to receive printouts of area occupancy lists following evacuation or when required.

Subproject III - Nuclear Materials Inspection and Storage (NMIS) Facility Upgrade

The NMIS Facility Upgrade will include a new storage vault and an intrusion detection system. A portal will be incorporated which will require satisfactory multi-credential identification to gain access to the building. Within the storage vault area, modifications will be made to the storage structures to prevent the unauthorized removal of Category I and IA amounts of special nuclear material.

Additional physical restraints will be placed over the cores of the ATR Critical Facility, which will increase time delay for fuel removal. These facilities will be equipped with occupancy detection and alarm systems for use when the facilities are unmanned.

Subproject IV - Security Alarm and Control Station (SACS) and Computer Systems

The SACS and its computer system will be located in an adjacent building. A large hardened room in this building will be modified for this installation. All doors into the vestibule, SACS, and Computer Room are hardened, with card reader entry control into the vestibule plus SACS operator confirmation to enter the SACS or the SACS computer room.

The FY 1987 funding budget authority (BA) of $2,750,000 will be used to complete subproject construction, equipment procurements and installations, and project management and inspection functions.

9. Purpose, Justification of Need for, and Scope of Project:

The upgrade proposals presented in this project are the result of an in-depth evaluation of the security measures, methods and practices currently in use at the TRA. This evaluation was performed by the Sandia National Laboratory Safeguards Engineering Division, Albuquerque, New Mexico.

The TRA security system is required to protect the ATR, NMIS, and other facilities from damage, destruction and theft. The replacement value of the ATR is currently estimated in excess of $225 million for structures and equipment. An assessment is not available for impact to the defense-related programs of which the ATR serves as an irreplaceable link.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test reactor area security system upgrade, Idaho National Engineering Laboratory

2. Project No.: 85-D-160

9. Purpose, Justification of Need for, and Scope of Project: (continued)

The TRA is operated in support of reactor safety testing and experimental programs as well as programs related to national defense goals. The TRA supports the operating of the ATR, various Physics Division programs, the Thermal Fuel Behavior Program, Power Burst Facility (PBF), Division Test Train Assembly Facility, and the NMIS Facility. PBF is currently conducting a series of severe fuel damage experiments for the Nuclear Regulatory Commission. The nuclear test train assemblies used in these experiments are assembled at TRA.

Approval of this project proposal will bring the TRA into compliance with the current scope and policies of Department of Energy (DOE) Orders 5632.1, Physical Protection of Classified Matter, and 5632.2, Physical Protection of Special Nuclear Materials (SNM). These orders establish policies for personnel credentials, accessibility based upon the two-man-rule to sensitive areas and materials, restriction of vehicle usage, and the application of alarm systems.

Subproject I - ATR Perimeter Protection

The present parimeter security fence around the TRA has no intrusion detection system in place to provide early warning for unauthorized entry into the TRA either by personnel crossing the fence line or forced vehicle entry through the fence. Alternate manpower-intensive measures are currently employed. A double security fence forming an isolating zone around the perimeter and use of diverse intruder detection systems will improve delay sufficient to permit guard assessment and response.

The new vehicle entry will improve examination capability and vehicle access control within the Test Reactor Area.

Subproject II - TRA Access Control

At present, the guardhouse in use is of insufficient size to properly control access to the TRA. Present personnel monitoring and access control equipment add to the congestion of an already undersized building.

The present guardhouse is of piecemeal construction as the result of 30 years of changes to the building structure. Although the present heating, air conditioning and ventilating systems are marginal for the equipment already in use, additional demands for electrical power, heating and air conditioning are projected. Building hardness is incomplete and only a few specified areas have been upgraded to the newly required building hardness requirements.

No briefing room for area orientation currently exists. Area orientations are conducted using video tape equipment in the main access area, which adds to the existing congestion. A new briefing room would also minimize entry to the TRA by occasional visitors, by providing meeting space when access to the TRA is not essential.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test reactor area security system upgrade, Idaho National Engineering Laboratory

2. Project No.: 85-D-160

9. Purpose, Justification of Need for, and Scope of Project: (continued)

Subproject III - NMIS Facility Upgrade

A second facility at TRA which will undergo security improvements is the Nuclear Materials Inspection and Storage Facility (NMIS). The NMIS building is used in support of all INEL projects which require the inspection and/or storage of nuclear materials in Categories IA and II. Currently, this includes the ATR, the ATR Critical Facility and PBF. Nuclear fuels were also being stored in the facility for the Engineering Test Reactor (ETR) and the General Electrical Test Reactor (GETR).

The NMIS building is used as the central storage location for SNM used in many projects including those in support of national defense goals. This centralized location for SNM makes the NMIS a realistic target for theft.

Subproject IV - Security Alarm Control Station and Computer System

The present security alarm and monitoring system is located in very congested quarters. The present location and system has neither the physical space nor system expansion capabilities to satisfy the enhanced security accessment and control requirements of TRA. The existing structure has been previously hardened but is no longer adequate to meet current security requirements.

10. Details of Cost Estimate: a/

		Item Cost	Total Cost
a.	Engineering, design, inspection and project management at 23% of item b ...	$	$ 1,204
b.	Construction costs ...		4,610
	(1) Improvements to land ...	1,310	
	(2) Building and structures ...	940	
	(3) Utilities ...	340	
	(4) Equipment ...	920	
	(5) Demolition and removal ...	40	
	(6) Special equipment (government furnished) ...	1,060	
c.	Contingency at 20% of items a and b ...		1,186
	Total Project Cost ...		7,000

a/ The above estimates are based on conceptual design estimates which are 100% complete.

EDI or contingency may be higher than anticipated because of the technical nature of some subproject designs and unforeseen demolition and removal.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test reactor area security system upgrade, Idaho National Engineering Laboratory

2. Project No.: 85-D-160

11. Method of Performance:

Overall responsibilities for design and construction will be assigned to the INEL prime contractor administered by DOE-ID. The INEL contractor will provide technical direction of the design effort. Construction will be accomplished by subcontractors awarded on the basis of competitive bidding.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

a. Total project costs	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
(1) Total facility funding						
(a) Construction line item	$ 0	$ 350	$ 2,276	$ 2,388	$ 1,986	$ 7,000
(b) PE&D	0	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total direct costs	$ 0	$ 350	$ 2,276	$ 2,388	$ 1,986	$ 7,000
(2) Other project costs						
(a) R&D necessary to complete construction	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
(b) Conceptual design costs	60	0	0	0	0	60
(c) Other project related costs	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Total other project costs	60	0	0	0	0	60
Total project costs (items 1 & 2) .	$ 60	$ 350	$ 2,276	$ 2,388	$ 1,986	$ 7,060

b. Other related annual costs (estimated life of project: 20 years)

(1) Facility maintenance and operating costs	$ 2,000
(2) Programmatic operating expenses directly related to the facility	0
(3) Capital equipment not related to construction but related to the programmatic effort	0
(4) GPP or other construction related to programmatic effort	0
Total related annual costs	$ 2,000

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test reactor area security system upgrade, Idaho National Engineering Laboratory (INEL)

2. Project No.: 85-D-160

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs - construction line item - no narrative required.

b. Other related annual costs - it is estimated that the facility will be used for 20 years for its programmatic purpose.

(1) Facility operating costs - these costs include security force, personnel demands, building energy and maintenance support, and maintaining equipment; are estimated to be $2,000,000.

(2) Programmatic operating expense directly related to the facility - none.

(3) Capital equipment not related to construction but related to programmatic effort - none.

(4) GPP or other construction related to programmatic - none.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington

2. Project No.: 82-N-103

3. Date A-E work initiated: 4th Quarter FY 1979

3a. Date physical construction starts: 2nd Quarter FY 1982

4. Date construction ends: 4th Quarter FY 1989

5. Previous cost estimate: $34,450
Date: 2/81

6. Current cost estimate: $36,000
Less amount for PE&D: 1,550
Net cost estimate: $34,450
Date: 1/82

7. Financial Schedule:

Fiscal year	Authorization	Appropriations	Obligations	Costs
1982	$ 34,450	$ 10,000	$ 10,000	$ 826
1983	0	7,000	7,000	4,528
1984	0	3,570	3,570	5,419
1985	0	9,700	9,700	11,851
1986	0	2,069	2,069	5,233
sequestered 1986	0	(111)	(111)	(67)
1987	0	2,000	2,000	5,167
1988	0	111	111	1,000
1989	0	0	0	426

8. Brief Physical Description of Project:

This project will provide the facilities, processes and/or structures for the isolation of single-shell waste storage tanks, surveillance instrumentation to monitor waste storage tanks, and measures to minimize the potential for release of radioactive materials to the environment.

The following are examples of the facilities, processes and/or structures provided by the capital funds for this project:

a. All old single-shell waste tanks will be isolated from the active waste handling system. Piping will be disconnected and capped; and risers and ventilation systems will be sealed. This will prevent the inadvertent addition of liquids into the tanks after liquids have been removed during the stabilization effort.

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington

2. Project No. 82-N-103

8. Brief Physical Description of Project: (continued)

b. Sealing of single-shell auxiliary waste storage tanks, vaults, pits, related containment vessels, pumping equipment, dome risers, pit drains, etc., against unplanned addition of liquids by installation of at least one positive physical barrier on dome risers, water, steam, air, process lines, etc. If a structure cannot be secured by severing and sealing lines, a suitable closure capable of sealing and preventing unauthorized entry or removal will be installed. Methods of isolation will allow future access, if required.

c. Provision of surveillance instrumentation to monitor single-shell waste storage tanks for pressure, the presence of combustible gas, the measurement of solid and liquid contents and to indicate movement or structural degradation of waste storage tanks, tank walls, and domes. Additional dry wells will also be provided on the tank periphery where required. Fixed and mobile instrumentation will be utilized to monitor and record the parameters for tank surveillance. Bench marks will be affixed to the tank domes for survey measurement of dome differential. Thermocouple trees will be installed in the interior of larger high temperature single-shell tanks. A riser on each tank will be modified to allow connection of a portable exhaust system to preclude releases to the environment when a tank flange is removed for inspection of instrumentation.

d. Upgrading of the 200 Areas cathodic protection system to protect the buried carbon and stainless steel pipelines and catch tanks against galvanic corrosion.

e. Expansion of the Computerized Automatic Surveillance System (CASS) by connecting remote alarms to CASS substations. This will centralize surveillance for the 200 Areas in the 2750-E Waste Management Surveillance and Operations Facility.

f. Provide necessary transportable grout equipment and facilities and support materials handling equipment to immobilize radioactive liquid waste.

g. Provision of/or modification of existing facilities, processes and/or structures, for improved handling and stabilization of waste which is either being concentrated and stored in existing Hanford facilities or in adjoining areas. Such efforts would minimize the amount of waste which must be stored and stabilized, thus reducing the potential for releases to the environment. Through a combination of process improvements and new processes, wastes would be fixed for burial or lower cost storage.

The FY 1987 funding will allow for completion of construction.

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington

2. Project No.: 82-N-103

9. Purpose, Justification of Need for, and Scope of Project:

Completion of the removal of freestanding liquid from the 149 old single-shell tanks at Hanford was accomplished in November 1980. Removal of the remaining pumpable liquid is scheduled to be completed in FY 1989. The primary purpose of this project is to maintain the old single-shell tanks in a safe, stable condition by providing for their long-term isolation, surveillance, and corrosion protection. In addition, the project includes a transportable grout facility to convert liquid low-level waste to a form suitable for shallow-land burial. This material is now stored in high-level waste tanks.

This isolation effort will place the single-shell waste storage tanks, related auxiliary facilities, and systems in a mode which will minimize the possibility of intrusion of liquids into these systems, thereby preventing the migration of radioactive materials from these tanks and/or containments. The surveillance instrumentation will provide increased monitoring capability for large single-shell waste storage tanks until long-term disposal options are implemented.

Upgrading the 200 Areas cathodic protection system will provide protection against galvanic corrosion of buried pipelines, catch tanks and other equipment.

The transportable grout facility will convert liquid low-level waste to a solid for shallow-land burial. Considering the cost of high-level waste tanks, where the waste is now stored, the subproject will have a payback of about two years. In addition, subject to the National Environmental Policy Act (NEPA) process, it may be possible that the contents of several existing high-level waste tanks can be reclassified as low-level waste and, therefore, could be processed through the grout facility, freeing up additional space for high-level waste operations at Hanford.

This project will provide such items as: (a) the facilities for the isolation of Hanford waste storage tank farms, (b) additional surveillance instrumentation for single-shell waste storage tanks and related systems, (c) additional protection against galvanic corrosion for buried pipelines and single-shell catch tanks, (d) a portable grout facility to process liquid low-level waste, and (e) additonal protection against gaseous or particulate releases from waste transfer on storage facilities.

10. Details of Cost Estimate: a/

	Item Cost	Total Cost
a. Title II design services at 7% of construction costs, item c		$ 1,700
b. Title III services at 8% of construction costs, item c		1,900
c. Construction costs		24,650
(1) Construction will include modification of existing risers to incorporate a valve assembly that connects to breathing filters on the isolated tanks	$ 500	

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a/ The above estimates are based on conceptual design and feasibility studies that are 87% complete.

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington

2. Project No.: 82-N-103

10. Details of Cost Estimate: (continued)

	Item Cost	Total Cost
(2) Special facilities including specialized pumps, piping, instrumentation, filter systems, job cranes, dry wells, caissions, and barriers	24,150	
d. Contingency @ approximately 22% of sums of items a - c		$ 6,200
Total estimated costs		$ 34,450

11. Method of Performance:

Title II design services will be performed by a negotiated architect/engineer contract. Title III services will be accomplished by the Cost-Plus-Award-Fee (CPAF) architect/engineering contractor. Construction and procurement will be accomplished by the onsite CPAF construction services contractor or fixed-price contracts and subcontracts awarded competetively.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

a. Total project costs	Prior yrs.	FY 1983	FY 1984	FY 1985	FY 1986	Complete	Total
(1) Total facility costs							
(a) Construction line item	$ 826	$ 4,528	$ 5,419	$11,851	$ 5,233	$ 6,593	$34,450
(b) PE&D	1,550	0	0	0	0	0	1,550
Total facility costs	2,376	4,528	5,419	11,851	5,233	6,593	36,000
(2) Other project costs							
(a) R&D necessary to complete construction	800	0	0	0	0	0	800
(b) Other project related costs .	350	300	250	150	50	200	1,300
Total other project costs ...	1,150	300	250	150	50	200	2,100
Total project costs (items 1 & 2)	$ 3,526	$ 4,828	$ 5,669	$12,001	$ 5,283	$ 6,793	$38,100

b. Other related annual costs	
(1) Annual facility operating cost	$ 600
(2) Programmatic operating expenses directly related to the facility	2,700
(3) Capital equipment not related to construction but related to the operating effort in the facility	100
Total related annual costs	$ 3,400

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington

2. Project No.: 82-N-103

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs
  (1) Total facility costs
    (a) Construction line item - no narrative required.
    (b) PE&D - no narrative required.

  (2) Other project costs
    (a) R&D necessary to complete construction

      The estimated conceptual design cost for this project is $950,000.

    (b) Other project costs

      These costs associated with project support and management activities are estimated to be $1,300,000.

b. Other related annual costs
  (1) Facility operating costs including manpower, energy, maintenance and shop supplies for operation of facilities and processes are estimated to be $600,000.

  (2) Programmatic operating expenses directly related to the facility, estimated to be $2,700,000, represent approximately one-half of the waste management operating costs for the Hanford waste management systems of which these facilities will be a part.

  (3) Capital equipment not related to construction but related to operating effort in the facility, including a special purpose vehicle for transport of solidified waste, are estimated to be $100,000.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands. Narrative Material in Whole Dollars.)

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1. Title and location of project: Defense waste processing facility, Savannah River, South Carolina

2. Project No. 81-T-105

3. Date A-E work initiated: 4th Quarter FY 1979

3a. Date physical construction starts: 1st Quarter FY 1984

4. Date construction ends: 4th Quarter FY 1989 a/

5. Previous cost estimate: $ 886,965
Less amount for PE&D: 16,965
Net cost estimate: $ 870,000
Date: 4/84

6. Current cost estimate: $ 886,965
Less amount for PE&D: 16,965
Net cost estimate: $ 870,000 b/
Date: 4/85

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7. Financial Schedule:

Fiscal year	Authorization	Appropriations	Obligations	Costs
1981 c/	$ 10,000	$ 0	$ 0	$ 0
1982	20,000	20,000	20,000	12,655
1983	30,000	40,000	40,000	35,511
1984	142,000	142,000	142,000	79,437
1985 d/	227,467	227,467	227,467	155,295
1986 e/	165,000	155,400	155,400	201,800
sequestered 1986	0	(8,000)	(8,000)	(6,200)
1987	135,000	135,000	135,000	235,100
1988	140,533	150,133	150,133	114,100
1989	0	0	0	36,102

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a/ Reflects 3 months delay because of FY 1986 reduction.
b/ Impact of schedule delay on cost estimate is being assessed; delay could increase costs.
c/ Funding was subsequently appropriated as PE&D.
d/ Reflects reduction of $1,733,000 for reprogramming of funds for Washington State sales taxes; and $1,300,000 for management initiative savings. The funding will be restored in FY 1988.
e/ Tentative allocation of $1,600,000 general reduction pending review of other projects.

1. Title and location of project: Defense waste processing facility,
Savannah River, South Carolina

2. Project No. 81-T-105

8. Brief Physical Description of Project:

The Defense Waste Processing Facility (DWPF) will solidify defense high-level radioactive waste at the Savannah River Plant (SRP) for temporary on-site storage, transportation to, and disposal in a Federal repository. This project will provide facilities to immobilize the high-level waste in borosilicate glass in steel canisters. The canisters will be stored on the SRP site until a Federal repository is available. Decontaminated salt will be solidified as a monolith with low permeability for disposal on-site as a low-level radioactive waste. The radioactive cesium separated from the salt will be combined with the sludge waste for vitrification. Alternately, the separated cesium could be made available for recovery and purification for beneficial uses. The DWPF will begin operation in early FY 1990 and will process the waste backlog inventory over approximately 10-15 years. The facility will be built near the H Chemical Separations Area and will include the waste processing facilities, waste storage vault, and power, service and other support facilities.

The main process building will be seismic and tornado resistant and will include remotely operated and maintained process cells containing process vessels and equipment which will be interconnected through systems of piping. The concrete walls will provide shielding against the highly radioactive waste solutions and solids. Cold feed chemicals and service systems, e.g., instrument connections, cooling water, steam, electrical power, etc., will be provided from adjacent areas behind the shielding walls to protect operating personnel. Ventilation air will be passed through a filter before final monitoring and discharge to the atmosphere. Also provided will be maintenance shops and areas, control rooms and similar service locations. New facilities and supporting services such as electrical substations, water wells, sanitary sewer systems, roads, shops and support facilities will be provided as needed.

This project will provide safe storage for 5 years' production of the radioactive waste glass in canisters. The storage facility will require minimum surveillance and attention. It is intended to store the immobilized waste on site until a Federal waste repository is available for disposal. The waste form and storage will be compatible with transportation to, and storage in, a waste repository. If the waste repository is not available on a schedule to meet DWPF production output, additional storage capacity can be added.

9. Purpose, Justification of Need for, and Scope of Project:

The DWPF will immobilize defense high-level radioactive waste at the SRP for disposal in a geologic repository.

Defense high-level radioactive waste results from processing irradiated reactor fuel at the SRP to produce nuclear materials for national defense. Approximately 30 million gallons of high-level waste (HLW) have accumulated from past production operations, and an additional five to ten million gallons will be generated through the year 2000. The waste is stored in large underground tanks which have a limited life and must be replaced periodically. This interim storage mode requires active maintenance, surveillance, and other operations to minimize releases of radioactive material to the environment. The DWPF will immobilize waste as a stable solid. This immobilization, and confinement in a geologic

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Defense waste processing facility,
Savannah River, South Carolina

2. Project No. 81-T-105

9. Purpose, Justification of Need for, and Scope of Project: (continued)

repository of the hazardous radionuclides, will ensure the long-term isolation of the waste from the environment with minimal maintenance and surveillance.

This project will provide facilities which will perform the following operations:

a. Transfer the treated HLW from waste storage tanks to feed tanks in the main processing building.
b. Process the waste to produce canisters of waste immobilized in borosilicate glass.
c. Store the filled containers on site pending transfer to a waste repository.
d. Solidify decontaminated salt for on-site disposal as low-level waste (LLW).

The FY 1987 funding is required to continue design and construction to maintain the project schedule for hot operations in early FY 1990, and to maintain the total estimated cost of $870 million. In FY 1987 final design will continue to more than 97 percent complete. Construction of the main process buildings and support facilities will continue to approximately 85 percent complete and procurements will be made for essential construction materials and equipment.

10. Details of Cost Estimate: a/

	Item Cost	Total Cost
a. Engineering, design and inspection		$ 208,000
(1) Engineering and design at 26% of construction costs (item b)	$ 176,000	
(2) Engineering control and inspection at 7% of construction costs (item b)	32,000	
b. Construction costs		578,000
(1) Improvements to land	13,000	
(2) Buildings	160,000	
(3) Other structures such as fan house, exhaust stack and sand filter	20,000	
(4) Special facilities such as piping processing equipment, mechanical systems and services	347,000	
(5) ADP equipment	3,000	
(6) Utilities	35,000	
c. Standard equipment		4,000
d. Contingency at approximately 11% of the sum of items a - c		80,000
Total estimated costs		$ 870,000

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a/ The above estimates are based on approximately 80% detailed design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Defense waste processing facility,
Savannah River, South Carolina

2. Project No. 81-T-105

11. Method of Performance:

Independent contractors will be used for selected tasks under the supervision of the operating contractor.

12. Funding Schedule of Project Funding and Other Related Funding Requirements:

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
a. Total project costs							
(1) Total facility costs							
(a) Const. line item.	$127,603	$155,295	$201,800	$235,100	$114,100	$ 36,102	$ 870,000
(b) PE&D............	16,965	0	0	0	0	0	16,965
Total fac. costs	144,568	155,295	201,800	235,100	114,100	36,102	886,965
(2) Other project costs							
(a) R&D.............	99,296	8,150	4,120	3,700	3,478	3,721	122,465
(b) DWPF tech support	12,233	13,504	15,603	20,998	16,215	5,129	83,682
(c) Other proj. related costs....	49,677	8,730	21,647	11,860	8,116	2,534	102,564
Total other proj. costs....	161,206	30,384	41,370	36,558	27,809	11,384	308,711
Total proj. costs (1&2)	$305,774	$185,679	$243,170	$271,658	$141,909	$ 47,486	$1,195,676

b. Other related annual costs (estimated life of project: 30 years).

(1) Facility operating costs (including decontaminated salt disposal)................................	$ 74,000
(2) Capital equipment not related to construction but related to programmatic effort in the facility....	6,000
Total other related annual costs (1989 dollars)..................	$ 80,000

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

a. Total project costs
   (1) Total facility costs
      (a) Construction line item - no narritive required.
      (b) PE&D - no narrative required.

1. Title and location of project: Defense waste processing facility,
Savannah River, South Carolina

2. Project No. 81-T-105

13. Narrative explanation of total project funding and other related funding requirements: (continued)

(2) Other project costs

(a) R&D

Optimization studies, completion of R&D support for demonstration of the process, technical interface with transportation and repository systems, and waste form optimization and characterization are estimated to cost $122,465,000.

(b) DWPF technical support

Technical support to design and construction during demonstration of equipment plus testing and run-in of DWPF equipment prior to in-plant installation is estimated to cost $83,682,000.

(c) Other project costs

Engineering studies, plant liaison drawing review, and coordination of development data and design, and construction checking are estimated to cost $102,564,000.

Additional funds associated with activities such as preparation of procedures, training of operating personnel, procurement of supplies, and system checking will be requested from the operations budget in years after 1986.

b. Other related annual costs - It is estimated the facility will be used 30 years for its programmatic purpose.

(1) Annual facility operating costs

Facility operating costs including labor, overhead, utilities and services, process technical support, cold feed chemicals, canister materials, and miscellaneous supplies are estimated to be $74,000,000.

(2) Capital equipment not related to construction but related to programmatic effort in the facility

It is estimated that replacement costs for melter, vessels, pumps, motors, etc., will be $6,000,000

Verification and
Control Technology

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
VERIFICATION AND CONTROL TECHNOLOGY

DEFENSE PROGRAMS
ATOMIC ENERGY DEFENSE ACTIVITIES
(TABULAR DOLLARS IN THOUSANDS. NARRATIVE MATERIAL IN WHOLE DOLLARS.)

	FY 1985 Appropriation	FY 1986 Adjusted Appropriation	FY 1987 Base	FY 1987 Request	Request vs. Base
Verification and Control Technology (DP)					
Verification and Control Technology (V&CT)					
Operating Expenses					
Program Resources.....	$ 70,460	$ 80,425	$80,425	$ 91,100	$+10,675
Program Direction.....	3,177 a/	3,776 b/	3,776 b/	4,400	+ 624
Subtotal Operating Expenses............	$ 73,637	$ 84,201	$84,201	$ 95,500	$+11,299
Capital Equipment......	2,000	5,600	$ 5,600	4,200	- 1,400
Construction..........	1,000	4,500	4,500	2,000	- 2,500
Verification and Control Technology..............	$ 76,637	$ 94,301 c/	$94,301 c/	$101,700d/	$+ 7,399
Total FTE's..............	64	66	66	66	--

Authorization: Sections 35 and 36, P.L. 87-297

a/ Reflects comparability adjustment reduction of $23,000 for one FTE transferred to Weapons Program and $40,000 rescinded in accordance with Section 2901 of the Deficit Reduction Act of 1982 (P.L. 98-369).

b/ Reflects comparability adjustment reduction of $24,000 for one FTE transferred to Weapons Program.

c/ Reflects $3,000,000 sequestered to comply with the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).

d/ The resources contained in the Verification and Control Technology decision unit support both the Office of International Security Affairs and Deputy Assistant for Intelligence.

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Confer.	Gramm-Rudman-Hollings	Subtotal	Comparability Adjustments	Adjusted Approp. Total
Verification and Control Technology (DP)					
Verification and Control Technology					
Operating Expenses	$ 87,225	$ -3,000	$ 84,225	$ -24	$ 84,201
Capital Equipment	5,600	-	5,600	-	5,600
Construction	4,500	-	4,500	-	4,500
Total, Verification and Control Technolgy	$ 97,325	$ -3,000	$ 94,325	$ -24	$ 94,301

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES
Verification and Control Technology
(In Thousands of Dollars)

FY 1986 Adjusted Appropriation/FY 1987 Base	$ 94,301
Program increases and decreases:	
o Detection Technology	
Supports space detection activities, improved verification techniques, advanced technology development and replacement of outdated systems	+ 7,609
o Analytical Support	
Provides for technical analyses with increased emphasis on material tracking, foreign application of technology to space, and nuclear terrorism intelligence	+ 3,066
o Program Direction	
Provides for increased personnel expenses	+ 624
o Capital Equipment	
Reflects completion of major capital equipment needs at Headquarters	- 1,400
o Construction	
Funding decrease for Space Science Lab (Project 85-D-171)	- 2,500
FY 1987 Request	$ 101,700

DEPARTMENT OF ENERGY

FY 1987 CONGRESSIONAL BUDGET REQUEST

VERIFICATION AND CONTROL TECHNOLOGY

Program Overview

The comprehensive goal of the Verification and Control Technology program is to support the development and execution of U.S. national security and foreign policies in treaty verification, intelligence, arms control, and export control as they pertain to the Department of Energy's defense-related responsibilities. The program: 1) conducts advanced research, development and fabrication of nuclear and other advanced technology weapon detection and characterization systems, including satellite-based sensors, in support of treaty verification and other National Command Authority requirements; 2) provides for development and operation of onsite and regional instrumentation for verification of compliance with current and potential nuclear test and arms control treaties; 3) reviews exports of materials, equipment and technology within DOE's areas of responsibility; 4) provides technical and analytical support in international nuclear arms control negotiations and related interagency deliberations; and 5) manages DOE's portion of the National Foreign Intelligence activities including analyses of foreign nuclear weapons and weapons material data, and assessments of foreign use of technology in energy, space and weapons. The first four activities funded under this program are managed by the Office of International Security Affairs under the Deputy Assistant Secretary for Security Affairs, and the fifth activity by the Deputy Assistant Secretary for Intelligence.

FY 1986 accomplishments include the:

- Delivery on time and within budget of satellite-borne nuclear explosion sensors for various satellites.
- Evaluation of an experimental regional seismic array in Norway in cooperation with the Defense Advanced Research Projects Agency (DARPA) to determine the value of this technology for verifying treaties limited or prohibiting underground nuclear tests.
- Review of approximately 7,000 applications for export licenses for nuclear and nuclear-related materials equipment and technology to ensure that exports are consistent with U.S. national security and nuclear nonproliferation policy.
- Nuclear weapon technical analyses for DOE policy development for international arms control deliberations.
- Support in production of National Intelligence Estimate relevant to DOE responsibilities.

Specific objectives for FY 1987 and beyond include:

- Continued fulfillment of the delivery requirements of satellite-borne sensors in support of nuclear treaty verification and other monitoring requirements.

- Maintenance and expansion of DOE's technology base to meet emerging treaty verification and monitoring requirements.
- Review of export license applications in order to preclude the transfer of sensitive commodities and technologies to countries of strategic or proliferation concern.
- Pursuing technical studies and providing technical expertise in interagency activities in support of arms control negotiations.
- Improved DOE capability to assess potential terrorist activities against nuclear facilities and programs.

Justification

Verification and Control Technology	FY 1987 Base	FY 1987 Request
Operating Expenses - Program Resources......	$ 80,425	$ 91,100
Program Direction......	3,776	4,400
Capital Equipment...........................	5,600	4,200
Construction................................	4,500	2,000
	$ 94,301	$ 101,700

The FY 1987 request represents a $7,399,000 increase over the FY 1986 adjusted appropriation.

This increase is attributed to initiation of a proposed joint technical experiment with the Soviet Union and a cooperative scientific venture with the Peoples Republic of China; response to National Security Council directives concerning improvement of U.S. treaty verification capabilities; space borne detection activities; technology development activities; greater requirements for analysis of national security and foreign policy pertaining to nuclear weapons-related issues; improved capabilities to track U.S.-origin SNM abroad; and related capital equipment requirements at the national laboratories.

Operating Expenses - Program Resources

Verification and Control Technology activities can be divided into two categories: detection and verification technology and analytical support. Detection/verification technology projects develop the means of detecting, measuring and characterizing nuclear or other advanced weapons activities. Analytical support activities utilize nuclear and advanced weapon technical expertise to evaluate arms control proposals, make determinations on export license applications, assess technology transfer issues, and analyze foreign weapon-related activities. Verification and Control Technology efforts are carefully coordinated with the Departments of Defense (DOD), State (DOS), and Commerce (DOC); Arms Control and Disarmament Agency (ACDA); Defense Advanced Research Projects Agency (DARPA), Central Intelligence Agency (CIA); and the Nuclear Regulatory Commission (NRC).

Detection Technology

In FY 1987 $67,814,000 is requested for detection/verification technology activities, a $7,609,000 increase over the FY 1986 adjusted appropriation.

DOE develops and fabricates satellite instrumentation and is a major participant in the national effort employing satellite-borne sensors to monitor the atmosphere and space for nuclear detonations. Satellite sensors provide test ban treaty verification data in support of the Limited Test Ban Treaty (LTBT) and other collection requirements. The DOE produced sensors provide worldwide surveillance and intelligence monitoring of nuclear tests carried out in the atmosphere, near earth or in near space.

In FY 1987, the Department will be required to deliver satellite sensors for several satellites. Resources are also required to conduct advance fabrication and procurement activities necessary to meet the delivery schedules for future years. As part of the space detection efforts, the Verification and Control Technology program also provides operational support such as the maintenance of appropriate facilities, procedures and documents to allow for proper design, fabrication, integration, testing, traceability, and as needed, failure analysis and flight-quality repair of DOE instrumentation.

Directed energy weapons (DEW), both ground-based and in space, are of increasing interest. The United States has embarked on an intensive DEW development program. DOE is conducting research on systems capable of detecting the emissions of directed energy devices.

U.S. nuclear test detection capabilities are currently focused on the Northern Hemisphere. In the near term, remote sensors are being developed and tested to detect and monitor nuclear debris in the Southern Hemisphere. The Department successfully demonstrated the capability to remotely monitor the atmosphere for nuclear debris using free-floating buoy platforms, a technology which is being adapted for ground stations. A network of surface air sampling stations is in place around the world to aid in detecting nuclear weapon tests in the atmosphere. Deployment, test and evaluation of the system at remote locations is scheduled in FY 1987.

The U.S. operates a global network of ground-based sample collection sites. Samples from these sites undergo DOE analysis as part of a cooperative program with other agencies.

DOE's in-country seismic program supports R&D for developing enhanced seismic verification capability at regional (short range) and local distances. This program ensures that DOE can fulfill its responsibility to provide in-country seismic equipment/systems to support U.S. verification of future nuclear test treaties. The DOE in-country seismic program conducted in FY 1987 will initiate transfer of the operation and maintenance of DOE's Regional Seismic Test Network (RSTN). The RSTN, a five-station network located in the United States and Canada, is a research tool operated to gain experience in the use of an in-country seismic system to monitor compliance with nuclear test restrictions through the detection of regional versus teleseismic signals. The RSTN provides the opportunity for experiments on regional seismic discriminants to distinguish between seismic signals generated by underground nuclear explosions and those generated by earthquakes, mine excavation activities, etc. The strengths and weaknesses of the existing system design will continue to be examined. In FY

1987, increased emphasis will be placed on use of high frequencies for detecting cavity-decoupled explosions. Additionally, the RSTN has provided the opportunity to collect data on the reliability of unmanned high technology seismic detection equipment operating under field conditions with minimum maintenance.

An advanced element of DOE's in-country seismic research program is the design, development, deployment and operation in Norway of a regional seismic array system. In a cooperative effort, the DOE and DARPA deployed and began operating an array system in 1984 under existing arrangements between DARPA and Norway. In FY 1985 the array achieved complete operational status and will collect regional seismic data for two to three years. The data will provide an additional basis for evaluating the utility of an array system for verifying compliance with treaties limiting or banning underground nuclear tests.

In FY 1986 negotiations began with the People's Republic of China (PRC) on a cooperative effort to culminate in the installation of a regional seismic array in the PRC. This array will provide valuable data on low-level seismicity not obtainable at teleseismic distances and on seismic wave propagation in the central Eurasian continent. Conceptual design of the array began in FY 1986, with fabrication to begin in FY 1987 after the U.S. and the PRC have reached agreement on the array installation.

The nonseismic detection (infrasonic monitoring) technology efforts in FY 1987 will focus on continued development of equipment and signal processing techniques for operational systems. Microphone arrays are used in the infrasonic technique for long-range monitoring of very low frequency sound waves generated by nuclear explosions that propagate in the upper levels of the atmosphere. This program has demonstrated the capability of detecting underground nuclear explosions and is developing the methodology for optimizing measurement and signal processing procedures. The infrasonic monitoring system could provide a valuable verification tool since it would not have to be deployed within the borders of a country to verify compliance with nuclear testing constraints. The overall goal of this program is the design, development, test and evaluation of a prototype system that may be deployed at overseas locations to supplement existing verification methods. The infrasonic program in FY 1987 will focus on deployment of trial remote arrays to test equipment and procedures, e.g., remote data transmission. Development of standardized processing and interpreting procedures for efficient handling of data from the array is an objective of the infrasonic program.

DOE bears certain responsibilities under the not-yet-ratified Threshold Test Ban Treaty (TTBT) and its companion Peaceful Nuclear Explosions Treaty (PNET). Under the PNET, the U.S. and the Soviet Union would be permitted to conduct observations and examinations of PNEs on each other's territories to make sure that individual explosions do not exceed the TTBT threshold. The Verification and Control Technology program is charged with providing the equipment, manpower, expertise, and full range of capabilities to permit the U.S. to fulfill the onsite verification responsibility of the PNET and verification responsibility of the TTBT.

DOE's role in this area of onsite treaty monitoring was recently expanded. These direct the verification community to take policy and technical actions designed to improve the verification of treaties limiting underground nuclear testing. In response to these directives, DOE is undertaking an effort utilizing direct yield measurement techniques in conjunction with normally scheduled underground explosions at the Nevada Test Site to determine to what extent TTBT verification capabilities can be improved. Throughout FY 1987, appreciable effort and resources will be applied on the nuclear weapon tests to properly evaluate this verification technique under expected TTBT conditions and to provide state-of-the-art, field-worthy equipment, including the necessary complementary local seismic network and a trained cadre for an onsite verification team.

The Verification and Control Technology program has the responsibility for the development, production and installation of onsite, local, and regional verification systems in the event of a Joint Technical Experiment (JTE) with the Soviets, as proposed by the President in 1985. In FY 1987 the equipment necessary for deployment will be fabricated.

Analytical Support

In FY 1987, $23,286,000 is requested for analytical support activities, a $3,066,000 increase over the FY 1986 adjusted appropriation.

Verification and Control Technology's analytical support activities are conducted through the national laboratories and private contractors in support of DOE's export control, technology transfer, arms control, weapons intelligence, and proliferation intelligence responsibilities. These activities provide a factual and analytical base to support U.S. needs in understanding the national security implications of possible test ban treaties, of export license decisions as they relate to proliferation and technology transfer concerns, and of foreign nuclear weapon programs. These activities serve the needs of the DOS, DOD, DOC, ACDA, the NRC, and the Intelligence Community, as well as DOE. Energy intelligence relating to energy supply, production transportation and utilization will be conducted to assess the effects of potential oil supply disruptions and to support the Department's emergency preparedness activities. The weapons, nuclear proliferation, energy supply and foreign technology assessments intelligence activities are executed by the Deputy Assistant Secretary for Intelligence. The arms control, export control, technology transfer and nuclear nonproliferation policy activities are executed by the Office of International Security Affairs.

Weapons intelligence within the Department of Energy (DOE) is responsible for supporting analysis for treaty negotiation, monitoring and verification. Of special concern is the threat to the U.S., its nuclear weapons and the U.S. nuclear weapons complex from foreign nuclear and nuclear-associated weapons systems capabilities.

DOE has established an education program for the Intelligence Community so that it may more effectively collect, identify, and analyze data to understand foreign nuclear capability and threats. Courses presented include an underground nuclear weapons testing orientation; policy and technical aspects of nuclear weapons proliferation; technologies of directed energy weapons; and the indicators of nuclear terrorism.

U.S. laws, treaties, and policies seek to promote the development of the peaceful applications of nuclear power while limiting the spread of nuclear weapons. Primary policy is governed by the Non-Proliferation Act of 1978 and the President's policy and decision statements of July 16, 1981, and June 4, 1982. The

DOE proliferation intelligence program supports the national policy with a program of studies of the nuclear capability in potentially proliferating countries. Additional studies follow the technology transfer policies, incentives and activities of possible nuclear supplier nations, and the worldwide movement, production, and utilization of SNM. This analysis provides key data for export and licensing decisions, foreign policy initiatives, and the overall nuclear capability assessment for both DOE and other U.S. Government agencies. FY 1987 resources will provide for continuation of the ongoing nuclear capability assessments for all currently identified possible proliferant countries, including new nuclear fuel cycle and weapons technology-related developments. The funding will also support continuing analysis of the proliferation impact of actions by technology supplier nations and the maintenance fuel cycle data base for use by DOE and other. A complementary system will also be developed and made operational as rapidly as possible to improve DOE capabilities to track U.S. origin SNM abroad. Modern data processing and knowledge base techniques will be employed as necessary to cope with accounting difficulties arising from burgeoning reprocessing, transformation and recycle of U.S. origin SNM in foreign thermal and breeder reactor programs.

The foreign technology intelligence assessments examine basic science and technology in the areas of: directed energy-related technologies; space nuclear power; technology transfer; and nuclear terrorism. This activity supports decisionmaking on export case reviews, foreign cooperation visits and programs, and on strategic analyses at both DOE and other U.S. Government agencies in carrying out legislative and executive mandates. This includes support to the National Security Council and Senior Interagency Group for Technology Transfer (SIG/TT).

Current intelligence on energy security meets the Department's needs for information on the prospects for disruption of oil supplies due to political, economic, and social instabilities within major producing nations of the Persian Gulf. The status of present and potential threats or conflicts must be analyzed and reported relative to the vulnerability and recovery capability as they impact the DOE responsibilities. Information on plans of advanced countries to limit economic damage of petroleum supply disruption will be assessed to provide a basis for DOE's plans and policies in international energy emergencies.

DOE provides the necessary analysis and technical review of more than 7,000 export cases each year to ensure that proposed exports are consistent with U.S. national security and foreign policy objectives. DOE serves as the secretariat for the interagency National Security Council Subgroup on Nuclear Export Coordination (SNEC), which reviews and makes recommendations on particularly sensitive export cases, based on the technical analyses and intelligence data provided by DOE. This analysis includes the development and refinement of various lists. The Militarily Critical Technologies List (MCTL) is a Department of Defense-led project to compile and incorporate into U.S. export control regulations the technologies of concern to our defense and security. DOE has primary responsibility for all nuclear-related technologies. The MCTL technologies are to be incorporated into the Department of Commerce's Commodity Control List (CCL) and will require periodic update. Another list, the Nuclear Referral List (NRL) contains commodities with a nuclear application. DOE reviews all Department of Commerce referred applications for export items on the NRL, as well as any other items destined for nuclear end uses.

A major effort is under way to upgrade the international trigger lists for the application of safeguards to exports. DOE is the lead agency for technical support to the Department of State on this effort. During FY 1984 and FY 1985, international negotiations were concluded for gas centrifuge enrichment components and an expanded list of components for reprocessing facilities. The current effort, to be concluded in late FY 1986 or early FY 1987, will include a comprehensive list of selected items required for a proliferant to produce nuclear explosives.

DOE is a major participant in the Coordinating Committee (COCOM) export control process with primary responsibility for the International Atomic Energy List (IAEL). COCOM is a voluntary organization of NATO countries (minus Iceland) plus Japan which controls sensitive exports to communist countries. Many COCOM countries use the export lists to also control exports to countries of proliferation concern. DOE maintains a computerized data base of nuclearrelated COCOM cases and chairs interagency working groups which address these exports. DOE is charged with responsibility for a major review of the IAEL.

DOE provides direct technical support in the arms control area to U.S. delegations at such forums as the U.N. Conference on Disarmament and its Group of Scientific Experts; Test Ban Treaty talks in Geneva; the Non-Proliferation Treaty Review Conference and Preparatory Committee meetings; and the U.N. General Assembly Special Session on Disarmament. Extensive analytical activities are conducted in the areas of strategic and tactical nuclear weapon systems to support the development of DOE arms control policy positions. DOE, as the agency responsible for the development, testing, manufacturing and retirement of nuclear weapons, plays a major role in interagency deliberations on treaties, agreements and proposals related to nuclear testing. In this capacity DOE draws upon the expertise of the national laboratories for technical support and special studies.

The level of effort for these activities will be significantly increased from FY 1986 only in the areas of improved accounting and security of special nuclear materials in international commerce.

Operating Expenses - Program Direction

	FY 1987 Base	FY 1987 Request
Program Direction..................................	$ 3,776	$ 4,400

In FY 1987, $4,400,000 is requested for program direction, a $624,000 increase over FY 1986. This funding is necessary to cover existing FTE levels and rising Federal manpower costs to manage an accelerated V&CT program initiated in earlier fiscal years and continuing in FY 1987.

Program Direction funds provide for the salaries, benefits, and travel expenses for 66 FTE's associated with the management and direction of this program at the Headquarters facility located in Washington, D.C. These employees are responsible for technical and analytical program management of field activities, and execution of Headquarters staff functions.

	FY 1987 Base	FY 1987 Request
Personnel Services and Benefits		
Personnel Compensation..........................	$ 3,231	$ 3,800
Personnel Benefits..............................	280	295
Subtotal..	$ 3,541	$ 4,155
Contractual Services		
Travel..	$ 270	$ 300
Subtotal..	$ 270	300
Total, Program Direction........................	$ 3,776	$ 4,400

Duties of Verification and Control Technology Headquarters personnel include:

- o Management, guidance, coordination and continuous review of research, development, test, and fabrication of systems for treaty verification and intelligence collection support; nuclear weapons treaty verification; and intelligence activities accomplished in the weapons complex.
- o Participation in Interagency Groups related to arms control, nonproliferation and export control matters.
- o Processing export applications related to the control of nuclear and nuclear-related materials, technology, and equipment.
- o Participation in arms control negotiations.
- o Providing Secretarial Officers with intelligence information relating to their programmatic responsibilities.
- o Assessment of information in support of nuclear nonproliferation and technology transfer control policies.
- o Participation in committees of the Director of Central Intelligence in matters relating to foreign nuclear weapons and foreign nuclear energy programs, capabilities, and resources.

Capital Equipment

	FY 1987 Base	FY 1987 Request
Capital Equipment................................	$ 5,600	$ 4,200

The FY 1987 request of $4,200,000 for capital equipment resources represents a $1,400,000 decrease from FY 1986 caused by completion of major needs relative to automation activities at the Headquarters. The FY 1987 funding request is required primarily at the various national laboratories to provide the high priority equipment needs generated by the technology and analytical support functions. These funds will support purchase of equipment to provide more timely intelligence analysis; upgrade existing electronics equipment; upgrade computer software/hardware systems; update technology of accessories to existing laboratory equipment; and develop the means for incountry treaty verification. The capital equipment supporting the Detection Technology activity constitutes the base of advanced technology development for V&CT activities at the national laboratories.

	FY 1987 Base	FY 1987 Request
Construction....................................	$ 4,500	$ 2,000

DOE will construct the Space Science Laboratory at Los Alamos National Laboratory (Project 85-D-171). This facility will be used for design, development, fabrication, assembly, test, calibration and quality control of space instrumentation, as well as for associated base technology efforts. The facility is needed to accommodate growth and increased delivery requirements already programmed into the late 1990's. Without the automated test, calibration, and checkout capabilities of the new facility, the manual methods now used could result in incomplete testing, less reliable instrumentation, and schedule delays. The total estimated cost of the facility will be $7,500,000 of which the final $2,000,000 is requested in FY 1987 for construction, design and procurement of standard equipment and for standard construction contingency. Construction Project Data Sheet 85-D-171 is attached.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
ATOMIC ENERGY DEFENSE ACTIVITIES
VERIFICATION AND CONTROL TECHNOLOGY
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

3. Date A-E Work Initiated: 2nd Qtr. FY 1985

3a. Date Physical Construction Starts: 1st Qtr. FY 1987

4. Date Construction Ends: 2nd Qtr. FY 1988

5. Previous Cost Estimate: $7,800
Date: 7/83

6. Current Cost Estimate: $7,500
Date: 2/85

7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1985	$ 7,500	$ 1,000	$ 1,000	$ 251
1986	0	4,500	4,500	3,300
1987	0	2,000	2,000	3,500
1988	0	0	0	449

8. Brief Physical Description of Project

This project will provide for the construction of a design, test, and fabrication facility required to accommodate growth programmed by the Office of International Security Affairs (ISA) over the last half of this decade and into the 1990's, primarily in satellite-based test detection activities involving technology development, developmental and prototype instrumentation on satellites and rockets, and operational deployment of instrumentation.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

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8. Brief Physical Description of Project (cont'd)

This facility will include a building of approximately 21,000 sq. ft. to accommodate about 40 people. It will contain development laboratories, instrumentation systems fabrication and assembly areas, test and calibration areas, drafting areas, controlled storage, clean areas, a vacuum laboratory, low-level radioactive source material storage, offices, computer facilities, a data distribution room a conference area, a library, a machine shop, storage areas, and support facilities.

As planned, the building will use a structural space frame system of construction with the most cost-effective materials available to allow the maximum open area, flexibility, and future expansion. A minimal-maintenance building envelope will be used for the exterior finish.

The building will be barrier-free for handicapped persons with an elevator provided for personnel, transport of instrumentation, and building services.

This project conforms to the Laboratory Long-Range Site Development Plan and Five-Year Interim Implementation Plan.

The site is served by existing utilities. Site work will include the expansion of an existing parking lot, curbs and walkways, landscaping, drainage, and erosion control. Utilities will include sanitary sewer, water, electrical power, steam and condensate, and communications services.

This project is located in an area served by an existing central energy system. The steam will be converted to hot water for space heating. Steam service will also be provided for space humidification.

The energy consumption of this facility will be minimized with energy conservation considerations including insulation, building orientation, earth-sheltered construction, passive solar features, auxiliary air fume hoods, heat recovery, economy-cycle cooling, night and weekend setback/shutdown, and energy efficient electrical and mechanical systems. Energy conservation features and systems will be integrated into the design at the beginning of Title I design in accordance with the General Design Criteria Manual, DOE Order 6430.1.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

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8. Brief Physical Description of Project (cont'd)

Summer temperature and humidity control will be provided for the computer areas, laboratories, small accelerator lab, and conference rooms by mechanical refrigeration. Evaporative cooling will provide summer temperature control for the drafting areas, offices, and library. Mechanical ventilation will be provided for the machine shop, equipment rooms, and rest rooms. Hoods will be required for some laboratories.

Power will be distributed throughout the building at 120/208Y volts and 277/480Y volts. The building will be equipped with a communications system and an intrusion detection system. Fire protection will be provided by a hydraulically designed wet-pipe sprinkler system. Plumbing and piping systems will consist of steam and condensate, heating hot water, potable hot and cold water, industrial hot and cold water, sanitary sewer, roof drain, compressed air, liquid nitrogen, nitrogen, house vacuum, lab vacuum, vacuum pump exhaust, circulating cooling water, and distilled water.

Standard equipment will include office and laboratory furnishings, machine shop equipment, computer terminals, audio-visual equipment, electronic test equipment, and conference room furnishings.

FY 1985 funding was used for Title I design. FY 1986 funding will be used for Title II design of the building and initial procurement leading to construction. FY 1987 funding will provide for construction, design and procurement of standard equipment, and construction contingency.

9. Purpose, Justification of Need for, and Scope of Project

The purpose of the proppposed project is to provide the facilities for the development, fabrication, assembly, testing, calibration, quality control, and operations associated with our satellite-related activities in the verification programs.

The verification program consists of three separate areas: satellite-based test detection, ionospheric monitoring, and infrasonic measurements. The satellite activities are by far the largest component and are expected to grow over the next several years, having received a large funding step in 1982 to support a vigorous technology development activity. We expect this development to continue with developmental and prototype instrumentation on satellite and rocket flights. The operational satellite program is growing also, with designs now being developed to be used in the programmatic instrumentation deployments on

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

9. Purpose, Justification of Need for, and Scope of Project (cont'd)

satellites during the last half of this decade and into the early 1990's. Follow-up operational programs for the 1990's are planned and are now in conceptual development. The rate at which satellite and rocket instruments must be produced, tested, and integrated is scheduled to increase markedly in the next five years. Further, the Space Shuttle will be the launch vehicle for most satellite systems, and, because of the human involvement, testing, quality, and safety issues must be much more elaborate than in past and current programs.

The project will provide new or expanded facilities, such as space for development laboratories, clean facilities, assembly bays, and modern computer-controlled test and calibration areas, for satellite and rocket instrumentation supporting the verification programs.

The technical mission of the sponsoring agency, as it relates to the proposed project, is to participate in the national verification programs. The DOE and Laboratory roles in this area are to develop and provide satellite instrumentation and to participate in deployment, operation, and data analysis associated with this instrumentation. The proposed facility is required to provide the new facilities necessary for performing the mission under evolving national requirements and new state-of-the-art technology.

Our laboratory facilities, clean space capabilities, modern automated test areas, data-handling facilities, and other resources are insufficient to carry out our verification responsibilities in a manner consistent with requirements. Without the project, the Laboratory's participation in these programs will continue to some extent, at least in the near term. In the verification programs, we will continue to participate by providing the small-scale instrumentation at the rate that has been adequate in the past. With the advent of the Space Shuttle and ever-increasing requirements for performance and quality, as well as the scheduled increases in instrumentation quantity, we will be unable to fulfill our obligations for long. Without the automated test, calibration, and checkout facilities, the manual methods presently employed will result in incomplete testing and less reliable instrumentation. In summary, the capabilities of the new facility are urgently needed; continuing in an already outmoded operation does not approach the efficiency, testing completeness, quality assurance (QA), and credibility promised by state-of-the-art technology in the new facility.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project Number: 85-D-171

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9. Purpose, Justification of Need for, and Scope of Project (cont'd)

The greatest urgency stems from already approved program schedules calling for a marked increase in the instrument delivery rate. Our participation in these missions depends on our ability to meet our schedule commitments and to use efficiently the opportunities afforded by the shuttle. Although a crash program to provide the proposed facility is not justified, the planned completion date in 1987 should not be extended.

The project, as conceived, is compatible with neighboring laboratory facilities. Construction in TA-3 near existing Earth and Space Science (ESS) Division facilities will allow future expansion to accomodate strong anticipated growth in Technical Intelligence Programs, and to provide facilities for activities now located elsewhere but planned for relocation in the long-range plan.

No special access or relationship to laboratory facilities for handling plutonium, high explosives (HE), other special nuclear materials, or strong radiation sources is required.

The major identified need of the using organization, ESS Division, is for the facility to provide a classified area in which to carry on activities associated with the verification program. These include instrumentation development, design, fabrication, assembly, test, calibration, and quality control activities. Because much of the instrumentation will be used in very expensive satellite and space shuttle systems, reliability and safety are emphasized. Qualifying materials, components, and designs, and maintaining traceability of systems delivered for flight are also necessary. Research-quantity radioactive sources and relatively low-level radiation-producing equipment will be used in these activities. The scientific and technical staff occupying the facility require a classified conference room and classified file room.

Development and design studies include instrumentation concepts and approach, physics experiments and measurements to define design parameters, engineering analysis, breadboarding of electronic circuits, prototype construction and evaluation, etc. Physics and electronic developmental laboratories, staff shop, and areas for design, procurement, fabrication, and testing are required for these activities within the organization.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

9. Purpose, Justification of Need for, and Scope of Project (cont'd)

Design interprets all of the above and produces detailed engineering, electronic, mechanical, thermal, and interface designs consistent with quality assurance and safety requirements.

Procurement, while straightforward in concept, can be long and complicated, especially for screened, high-reliability, and military specification components.

Acceptance inspection and testing not only determine if procured items meet specifications or procurement acceptance but also provide screening for performance, reliability, and QA. After testing, the items are then admitted to our parts stock and components are qualified for assembly into flight hardware. Controlled storage of components and subassemblies is necessary for items not immediately inserted into the fabrication activity. Both environment and access controls are required for many items.

Fabrication and assembly is a major activity extending from the construction of small subassemblies to complete payload packages. Facilities for preparing components cleaning space, as well as clean space for the assembly work, are required. In some cases, for certain materials and sensitive components, a controlled environment for temperature, humidity, and gas may be required.

Functional tests are carried out at many assembly stages and are repeated during operations with the full instrument assembly during handling and storage periods. These are normally performed at ambient conditions and are intended as a check on the "liveness" of the instrumentation.

Environmental tests are performed to ensure the instrumentation survival and performance in specification over a range of environmental conditions that includes the range expected in storage, shipping, integration, launch, and operational phases. Vacuum, thermal, and thermal vacuum tests will be carried out in the proposed facility, whereas vibration and shock tests will normally be performed elsewhere.

Calibrations are required to measure the instrumentation sensitivity to radiations for which the instrumentation is intended, and appropriately, to interfering stimuli to which the instrumentation may be exposed. Generally, in space we are attempting to measure x rays, gamma rays, neutrons, charged particles, and other signals in a mixed background. Radioactive sources, small accelerators, and other equipment, are required to perform the calibration tests.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

9. Purpose, Justification of Need for, and Scope of Project (cont'd)

After instrumentation has been partially or fully assembled, it may be stored for some period before further work or delivery is scheduled. Again, both access and environmentally controlled storage space is required. Physically, the area may be combined with the component storage area already described; however, storage details and control procedures may be different.

When instrumentation packages are scheduled for delivery to another facility, whether to Sandia Laboratories, with whom we work closely, to a military spacecraft contractor, to NASA, or to a field station where we are carrying out experiments, a final inspection and a functional test are usually required to confirm that the material is in proper condition for delivery. Delivered items will range from modules or subassemblies to complete payload assemblies comprising several complete instruments. Some of these will be for integration into additional payload, rocket, or satellite systems; some will be for repair, modification, or retrofit of systems already delivered, and some will be complete operating systems. In any case, predelivery activities must ensure that all appropriate requirements have been met, and that the material is flight ready or ready for deployment.

The actual instrumentation delivery must maintain the quality, performance, calibrations, and overall integrity of the items with mechanical, thermal, and other environmental protection as required. We use special shipping cases and materials, as appropriate. Space is required for preparing and packaging items for delivery and also for storing the shipping cases when they are not in use.

Field operations, as the term implies, are those activities carried out away from Los Alamos. For certain operations, space in the proposed facility for additional functions is required to support those operations. Operations feed data or questions back to Los Alamos for operational analysis and further interactions. Laboratory tests, instrument modification, repair, and design change evaluations all result from field operations.

More in-depth data analysis and programmatic data interpretation require use of both our distribution processor and the Central Computer Facility (CCF). A computer terminal room and appropriate data file are required in the Space Science Laboratory. Actual distributed processor facilities are to be located in another building.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project Number: 85-D-171

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9. Purpose, Justification of Need for, and Scope of Project (cont'd)

Modern state-of-the-art methods are essential to the quality and cost efficiency required by our programs. Computer-automated test and evaluation capabilities will achieve the utmost from our testing, calibration, and other appropriate functions. The proposed facility is strongly oriented toward providing the instrumentation space and equipment required to meet our responsibilities.

No unusual design or construction requirements are anticipated.

10. Details of Cost Estimate*

a. Engineering, design, and inspection at about 15% of construction costs, Item b.**		$ 745
b. Construction costs		5,100
(1) Improvements to land, including landscaping, parking lot expansion, curbs and walkways, and drainage	$ 260	
(2) Laboratory-office building 21,000 sq. ft. at approximately $210 sq. ft.	4,440	
(3) Other structures	0	
(4) Special facilities	0	
(5) Utilities, including fire and potable water service, sanitary sewer, electrical power, steam and condensate, and data communications services	400	
c. Standard equipment, including modular laboratory and office furnishing systems, shop equipment, laboratory equipment, and clean modules		1,110
Subtotal		$ 6,955

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

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10. Details of Cost Estimate* (cont'd)

d. Contingencies at approximately 8% of above costs ***	545
Total project cost	$ 7,500

*The Laboratory used escalation rates of 2.9% for FY 1983, 4.9% for FY 1984, 8.3% for FY 1985, 9.3% for FY 1986, and 7.1% for FY 1987. These rates were forecasted using "Data Resources Incorporated" forecasting services. These services were contracted by the DOE.

**Engineering, design, and inspection costs are projected from historical records and experience, then applied based on the complexity of the project.

***Contingencies are applied to items based on the uncertainties of the development at the conceptual level.

11. Method of Performance

Design and inspection of the facility will be performed under a negotiated architect-engineer contract. Fixed-price contracts and subcontracts will be awarded for construction on the basis of competitive bids. Design, procurement, and installation of standard equipment will be performed by the operating contractor.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

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12. Funding Schedule of Project Funding and Other Related Funding Requirements

a. Total project funding	Prior Yrs.	FY 1985	FY 1986	FY 1987	FY 1988	Total
(1) Total facility costs						
(a) Construction line item..........	$ 0	$ 251	$ 3,300	$ 3,500	$ 449	$ 7,500
(b) CP&D..........................	0	0	0	0	0	0
(c) Expense funded equipment........	0	0	0	0	0	0
(d) Inventories.....................	0	0	0	0	0	0
Total facility costs...........	$ 0	$ 251	$ 3,300	$ 3,500	$ 449	$ 7,500

(2) Other project funding	Prior Yrs.	FY 1985	FY 1986	FY 1987	FY 1988	Total
(a) Conceptual design...............	$ 100	$ 0	$ 0	$ 0	$ 0	$ 100
(b) Other project-related costs.....	0	0	0	0	0	0
Total other project funding....	100	$ 0	$ 0	$ 0	$ 0	$ 100
Total project funding (Items 1 and 2)	$ 100	$ 251	$ 3,300	$ 3,500	$ 449	$ 7,600

b. Total related funding requirements (estimated life of project: 25 years)

(1) Facility operating costs..............................	$ 250
(2) Programmatic operating expenses directly related to the facility..............	0
(3) Capital equipment not related to construction but related to the programmatic effort in the facility..............	480
(4) GPP or other construction related to programmatic effort in the facility..............	1,000
(5) Other costs..............................	0
Total other related annual funding requirements..............	$ 1,730

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory, Los Alamos, New Mexico

2. Project Number: 85-D-171

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13. Narrative Explanation of Total Project Funding and Other Related Requirements

a. Total project funding

(1) Total facility

(a) Construction line item. No narrative required.

(b) CP&D is not requested.

(c) No expense-funded equipment is anticipated for this project.

(d) None will be required.

(2) Other project funding

(a) Conceptual design costs. No R&D will be required.

(b) No other project-related funding is anticipated.

b. Total related funding requirements

This facility will be used for its programmatic purpose for 25 years.

(1) Facility operating costs

This category includes maintenance, janitorial, and utilities calculated from FY 1984 costs on a per square foot basis throughout the Laboratory and projected through FY 1988.

Maintenance and janitorial base costs were escalated at a 5% rate for FY 1985 and FY 1986 and at 7.5% for FY 1987 and FY 1988. Utility base costs were escalated at a 10.8% rate for FY 1985 and 12.1% for FY 1986 through FY 1988. Using maintenance and janitorial base costs (1984) of

CONSTRUCTION PROJECT DATA SHEET

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1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project Number: 85-D-171

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13. Narrative Explanation of Total Project Funding and Other Related Requirements (cont'd)

$3.93/sq. ft. and $4.36/sq. ft. for utility base rate yields a FY 1988 cost of $5.01/sq. ft. for maintenance and janitorial with $6.81/sq. ft. for utilities for a total of $11.82/sq. ft. The product of $11.32 and 21,000, the area of the building, is approximately $250,000.

(2) Programmatic operating expenses directly related to the facility

All personnel operating this facility will be relocated from various sites throughout the Laboratory, therefore there will be no incremental increase in the programmatic operating expenses directly related to this facility.

(3) Capital equipment not related to construction but related to the programmatic effort in the facility.

Approximately $480,000 per year is anticipated.

(4) GPP funding for development laboratory space will be required to sustain the programmatic expansion until the facility comes on line and thereafter.

(5) Other costs are not anticipated.

Nuclear Safeguards
and Security

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
NUCLEAR SAFEGUARDS AND SECURITY
ATOMIC ENERGY DEFENSE ACTIVITIES

(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Appropriation	FY 1986 Adjusted Appropriation	FY 1987 Base	FY 1987 Request	Request Vs.Base
Nuclear Safeguards and Security					
Operating Expenses					
Program Resources............	$48,118 a/	$45,345	$45,345	$53,417	$+8,072
Program Direction............	7,196 b/c/	7,253 b/	7,253	7,683	+ 430
Total Operating Expenses...	55,314	52,598	52,598	61,100	+8,502
Capital Equipment..............	4,700	4,455	4,455	4,800	+ 345
Construction...................	-	-	-	1,000	+1,000
Nuclear Safeguards and Security..	$60,014	$57,053 d/	$57,053	$66,900	$+9,847
Staffing Total FTE's Direct......	186 e/	182 e/	182	182	-

Authorization: Section 31, P.L. 83-703

a/ Reflects comparability adjustment of $2,567,000/seven FTE's to Weapons Program.
b/ Reduced by $69,000 in FY 1985 and $72,000 in FY 1986 to reflect comparability transfer of three FTE's to Weapons Program.
c/ Reflects rescission of $50,000 in accordance with Section 2901 of P.L. 98-369.
d/ Reflects $1,800,000 sequestered to comply with the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).
e/ Reflects comparability adjustment of three FTE's to Weapons Program.

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Confer.	Gramm-Rudman-Hollings	Subtotal	Comparability Adjustments	Adjusted Approp. Total
Nuclear Safeguards and Security					
Operating Expenses	$ 54,325	$ -1,655	$ 52,670	$ -72	$ 52,598
Capital Equipment	4,600	-145	4,455	-	4,455
Construction	-	-	-	-	-
Total, Nuclear Safeguards and Security	$ 58,925	$ -1,800	$ 57,125	$ -72	$ 57,053

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
Nuclear Safeguards and Security

(Dollars in Thousands)

FY 1986 Adjusted Appropriation/FY 1987 Base	$ 57,053
Program Increases and Decreases:	
Increased Operating Expenses provide 5% escalation	+ 2,267
Increase in Safeguards and Security operations to support such areas as computer security, Central Training Academy, communicated threat, insider threat, etc	+ 2,903
Increase in Technology to support increased emphasis on insider threats	+ 1,871
Increase in the International program to provide strengthening of international safeguards in support of U.S. nonproliferation and national security	+ 589
Increase in Classification program for enhanced technical programmatic support	+ 442
Increase in Capital Equipment provide 5% escalation ($223,000) and other minor adjustments ($122,000)	+ 345
Increase in Program Direction covers additional salaries, benefits, travel, etc	+ 430
Increase for Nuclear Safeguards Technology Laboratory, Los Alamos, New Mexico	+ 1,000
FY 1987 Budget Request	$66,900

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
Nuclear Safeguards and Security

(Tabular dollars in thousands. Narrative material in whole dollars.)

Program Overview

The Nuclear Safeguards and Security program is responsible for developing measures to assure adequate protection of DOE's nuclear weapons, nuclear materials, facilities, and classified information against theft, sabotage and terrorist activity; and providing safeguards technical support to U.S. and international activities designed to minimize the likelihood of proliferation of nuclear weapons. As part of this budget, the Classification program is responsible for implementing the DOE's classification and declassification activities.

Recent accomplishments include: establishment of a Central Training Academy to assure a high standard of readiness throughout DOE and to enable a uniform approach to training in the tactical, legal, and technical aspects of physical security; activities to support site-specific safeguards and security improvements; systematic evaluations of the significance of safeguards and security weaknesses; and the execution of agreements with the United Kingdom, France, European Community, and Federal Republic of Germany for cooperation in the development of safeguards instrumentation.

Program objectives include rescoping research and development activities to phase out "turn-key" deployment of safeguards technology and systems. Consistent with this rescoping initiative, research and development priorities will be shifted to address the potential "insider" threat at our critical installations starting in FY 1986, with implementation in FY 1987. Emphasis will be placed on nuclear material control and nuclear material accounting efforts (e.g., advanced measurement instrumentation) to help mitigate the threat of theft, diversion, or sabotage. As a supplement to this effort, policy guidance will be issued for the implementation of a "human reliability program" Department-wide. This program is needed to insure the continued reliability of personnel in critically sensitive nuclear material handling and other positions. The Department is continuing to enhance its computer security program to protect the sensitive classified information processed on computer systems. Federal Aviation Administration approval to implement new or reinstitute former airspace restrictions over sensitive DOE facilities is being sought. Master Safeguards and Security Agreements are being developed for all critical nuclear facilities. Objectives will continue to emphasize: improved effectiveness of safeguards and security through intensified guard force training utilizing the Central Training Academy, assistance in the identification of deficiencies at DOE facilities, support of classification activities, development of international safeguards, training of foreign safeguards personnel, development of technology in physical protection and material control and accounting, and tracking of nuclear material shipments.

The conduct of these activities will fulfill DOE's responsibilities under pertinent public laws and treaties or agreements, providing for improved protection of the DOE's nuclear weapons and nuclear materials facilities, and for sensitive classified information.

Justification

The FY 1987 request for the Nuclear Safeguards and Security Program is $66,900,000, an increase of $9,847,000 above the FY 1986 adjusted appropriation. The FY 1987 request provides $62,595,000 for the Nuclear Safeguards and Security portion of the program and $4,305,000 for the Classification portion of the program. The details of this budget are provided in the subsequent discussions of program efforts.

	FY 1986 Adjusted Appropriation	FY 1987 Request
Operating Expenses - Program Resources.........	$45,345	$53,417
- Program Direction.........	7,253	7,683
Capital Equipment............................	4,455	4,800
Construction..................................	-	1,000
	$57,053	$66,900

Operating Expenses - Program Resources

The FY 1987 request for program-related operating expenses is an increase of approximately $8,072,000 above the FY 1986 adjusted Budget Authority, but less than $3,500,000 over the level-of-effort Safeguards and Security program detailed in our FY 1986 budget. In FY 1986, the level-of-effort is being maintained by utilization of prior-years carryover.

Safeguards and Security Operations

The FY 1987 operating expense request is $32,721,000, a net increase of $4,323,000 above the FY 1986 adjusted appropriation of $28,398,000.

Safeguards Operations

The FY 1987 operating expense request for safeguards operations reflects a shifting of priorities, from a program of emphasis on large-scale hardening features and effective protection against outsider adversary intrusions, to a program of emphasis on protection against insider threats. Over the past approximately 3 years, efforts have been to assist in the identification of deficiencies at DOE facilities and assist field managers in applying state-of-the-art large-scale hardening features, surveillance equipment, and guard force response capabilities. Further consultation will be provided in these areas while encouraging participation by commercial vendors in direct field implementation projects funded from outlay programs. Emphasis in FY 1987 is on provision of technical assistance for required improvements at DOE facilities to counteract the insider threat of sabotage and diversion of special nuclear material, and demonstrate advanced integrated concepts at selected sites.

Those facilities for which the combined threat, vulnerability, and consequences are potentially highest will be given highest priority. During FY 1987, projects are required to support significant material control and accounting improvements at virtually all DOE facilities with attractive special nuclear material. Physical protection projects will be directed to provide assistance in effective protection against potential insider threats such as sabotage of vital facilities and components, and the diversion of nuclear material. Based on documented and comprehensive vulnerability analyses, substantial effort is directed in FY 1987 toward implementing advanced improvements in controlling and accounting for nuclear material to a level consistent with the DOE threat guidance. This includes projects for obtaining quality measurements or controls on specific nuclear materials that are inherently difficult to measure or are entrained within processing equipment and are inaccessible for conventional measurement methods. Projects addressing such problems at existing facilities are planned in FY 1987 at Idaho, Oak Ridge, Rocky Flats, Hanford, and Savannah River complexes. Rapid measurement and data management will be combined with information from process control and related physical protection subsystems. Similar advanced systems will be developed for new facilities under construction or soon to become operational at Idaho, Savannah River, Oak Ridge, and Richland.

These research and development activities also provide technology transfer, follow-on consultation to the field in the areas of vulnerability identification and effectiveness evaluations, safeguards training and workshops, and the application of state-of-the-art measurement methods for field office inspection and quality assurance.

The FY 1987 budget request also provides operational support to an effective Nuclear Materials Management and Safeguards System (NMMSS), and the DOE New Brunswick Laboratory. NMMSS is a computerized national data base of information on transactions and inventories of accountable nuclear materials. The New Brunswick Laboratory serves as the U.S. Government safeguards analytical laboratory to provide materials and services primarily to DOE field offices and contractors in fulfilling safeguards requirements essential for the control and accounting of nuclear materials and related materials. This includes: (1) providing measurement services in support of Government audit and inspection requirements; (2) assessing and evaluating measurement technology in support of DOE fuel cycle and weapons production activities; (3) developing, certifying, and distributing reference materials for calibration and standardization of materials measurements; and (4) assisting in technology exchange and training in measurement technology.

Security Operations

Security operations in FY 1987 will emphasize (1) increased developmental activities in computer security for improved protection of classified computer security operations, and (2) continue improving the capabilities of the Department's protective forces.

An enhanced computer security program is being developed within the Department to further improve the security of classified information processed with DOE computer systems. The research and development funding is planned to be increased in FY 1987 to meet the expanded national level requirements for applying secure/trusted computer systems when processing sensitive classified information. Recent inspections by the Defense Programs Inspection and Evaluation team have indicated a severe lack of security awareness in the area of computer security. A significant effort will be the training of the many hundreds or thousands of personnel who have been recently assigned computer security responsibilities. More secure means to enhance security of DOE's computer systems will be developed and implemented through local area networks, wide-band communications networks, or satellite systems.

The Department's Central Training Academy in Albuquerque will expand its capability to provide protective force officers with the tactical, legal, and technical training they need to effectively protect DOE facilities. Supporting this enhanced training capability will be the development and operation of the Engagement Simulation System (formerly Multiple Integrated Laser Engagement System, MILES) second generation of force-on-force training equipment for protective forces.

We will continue the development of advanced audio countersurveillance and suppression in technology in support of the intelligence community technical security operations, as well as continue to aid the DOE security and intelligence communities in a research and development program in technical surveillance.

The Nuclear Safeguards and Security program will continue to support the capability established in prior years to perform comprehensive technical and psychological threat credibility assessments. These analyses by a team of highly skilled analysts of actual threat communications serve as a national asset to the Department's Emergency Action and Coordination Team (EACT), the Federal Bureau of Investigation (FBI), and the Nuclear Regulatory Commission (NRC). This capability will also be utilized, as needed, in support of other appropriate Federal, state, and local law enforcement agencies through the FBI. In FY 1987, it is planned to establish a technically "secure" Credibility Assessment Team Communications System (CATCOMS). Threat exercises have identified such a requirement to reduce the vulnerability of crisis communications to interception. The secure CATCOMS would be used as the prime communication channel for crisis management in DOE.

In operational security areas, DOE will continue to support vulnerability assessments of program activities, and will increase activities related to employee security education and hostile intelligence threat awareness; domestic and foreign threat assessments; and the validation of safeguards and security needs as related to line-item construction projects.

Safeguards and Security Technology and Systems Development

The net increase of $2,403,000 in the FY 1987 level of $13,050,000 over the FY 1986 adjusted appropriation of $10,647,000 for technology and systems development reflects an increased emphasis on addressing potential insider threats at DOE facilities. This new emphasis in FY 1987 features three development areas that will contribute to providing insider threat protection at levels consistent with DOE threat guidance and requirements. This shift in emphasis in safeguards technology and systems development to insider threats is reflected by three topical areas: integrated material control systems, supporting physical protection technologies, and improvements in the quality of confirmatory nuclear material accounting.

To provide effective protection against potential insider threats at DOE production and processing operations, integrated nuclear material control systems and concepts will be applied within the confines of DOE nuclear facilities to provide direct detection and deterrence capabilities against actions by malevolent insiders. Systems concepts and technologies will be developed to establish detection networks from existing information systems, such as processing operations, health and safety, and production quality control, and integrating this relevant safeguards information into a timely system of internal controls sensitive to insider attempts of malevolent action. The need for such internal protection systems and consequences of potential threat of sabotage to vital DOE processing and production operations requires additional developmental support in the area of physical protection techniques. Physical protection developments in FY 1987 will emphasize technology and systems development for monitoring and control of authorized personnel movements inside DOE nuclear facilities. In addition, technological developments will provide improvements in tamper-safing and detection, and internal surveillance techniques.

The Department is committed to improvements in the quality of nuclear material accounting at the DOE nuclear processing facilities. In light of potential insider threats, such improvements are needed to confirm the effectiveness operation of internal protection systems and to reduce inventory and shipper-receiver differences to commensurately minimal levels. In FY 1987, improvements will be sought in measurement technology and in "secure" data base management and analysis methods. The results of these developmental efforts are expected to have a significant impact on future upgrading and improvement programs sponsored by DOE outlay programs.

International

The FY 1987 operating expense request of $5,345,000 for International Activities is an increase of $815,000 over the FY 1986 adjusted appropriation of $4,530,000. This amount will permit increased progress on the DOE's two highest priority efforts in this area, with the primary objective to strengthen international safeguards in support of U.S. nonproliferation and national security. There will be increased bilateral cooperation, including new technical exchanges with the United Kingdom and France, and continuing cooperation with EURATOM and other Member States, including exchange of information, staff, and equipment for projects to improve the application of newly developed equipment for international safeguards and physical security of nuclear materials. Research and development will continue on new and improved technology and systems for IAEA safeguards, including increased effort on safeguards for reprocessing plants and continued effort on fuel fabrication plants.

The DOE decision to develop and demonstrate the atomic vapor laser isotope separation (AVLIS) process introduced a new requirement for research and development of international safeguards methods and equipment for use with AVLIS under the U.S.-IAEA treaty agreement for the application of international safeguards in the U.S. The research and development must address the possible impact on the design of AVLIS plant equipment, and must be established early in the development and demonstration phase of the plant equipment. The budget impact of this work is offset by termination of the corresponding development for the Portsmouth Gas Centrifuge Enrichment Plant.

Classification

The Office of Classification is responsible for implementing the DOE's classification and declassification program. The objectives of the program are to establish and implement policy for the classification of Restricted Data, Formerly Restricted Data, and National Security Information within DOE's jurisdiction in accordance with the requirements of the Atomic Energy Act of 1954, as amended, and applicable Executive Orders. The program must also assure the continuous review of Restricted Data in order for the Assistant Secretary for Defense Programs to determine what may be declassified and disseminated in the interest of scientific and technical progress and the general public welfare, without damage to the national security.

Specifically, the program (1) provides continuing guidance and oversight to Headquarters and field organizations on classification and declassification policies and procedures; (2) develops and updates classification guidance for nuclear weapons and other classified areas; (3) handles classification and declassification reviews, such as Freedom of Information Act requests and Mandatory Review requests pursuant to Executive Order 12356; (4) performs appraisals of Headquarters, field office, and contractor classification functions; and (5) conducts classification educational activities at DOE Headquarters.

The FY 1987 budget request includes $2,301,000 for technical programmatic support activities, an increase of $531,000 above the FY 1986 adjusted appropriation of $1,770,000. Programmatic support is required to: (a) develop classification guidance in such areas as advanced nuclear technologies and sensitive nonnuclear technologies; (b) continue development and support for the classification automation system; (c) review sensitive technologies at DOE program offices; (d) improve the classification appraisal program to ensure that more frequent appraisals are conducted at DOE Headquarters and in the field offices; (e) develop a comprehensive education program for management and authorized classifiers in Defense Programs; and (f) enhance quality assurance activities.

Capital Equipment

	FY 1986 Adjusted Appropriation	FY 1987 Request
Capital Equipment..................................	$ 4,455	$ 4,800

The FY 1987 request for capital equipment is an increase of $345,000 above the FY 1986 adjusted appropriation. The request includes such items as confirmatory measurements units, a thermal ionization mass spectrometer, security countermeasures, and computer security test and evaluation equipment, etc.

Construction

	FY 1986 Adjusted Appropriation	FY 1987 Request
Construction.......................................	-	$ 1,000

The FY 1987 request supports Project 86-D-186, Nuclear Safeguards Technology Laboratory, Los Alamos, New Mexico, with a total estimated cost of $10,600,000. This project will be a unique center for United States nuclear safeguards development and application. The project provides for centralized instrumentation development laboratories specifically designed for safeguards requirements; urgently needed space for the development, testing, and evaluation of measurement and accountability systems for implementation in DOE nuclear facilities; and facilities to support rapid transfer of advanced safeguards technology to the nuclear community.

At present, the safeguards research and development facilities are not in a security area. Because of this, nuclear materials must be transported from a different site, guarded by armed personnel while in use, and returned to the original site at the end of the working day. The Nuclear Safeguards Technology Laboratory will be a materials access area within a protected area. Thus, during required periods, the daily transportation of special nuclear material over public access roads between an offsite vault and the safeguards laboratories will be virtually reduced to zero.

Operating Expenses - Program Direction

	FY 1986 Adjusted Appropriation	FY 1987 Request
Program Direction..................................	$ 7,253	$ 7,683

The FY 1987 request is $430,000 above the FY 1986 adjusted appropriation. The program direction funds provide for the salaries, benefits, and travel expenses for 133 positions associated with operational and management responsibilities of the safeguards and security and classification programs. This request reflects an increase in personnel compensation, benefits, and travel.

The following table is a detailed breakdown of the Nuclear Safeguards and Security program direction budget:

	FY 1986 Adjusted Appropriation	FY 1987 Request
Personnel Services and Benefits		
Personnel Compensation	$ 6,354	$ 6,560
Personnel Benefits	695	721
Subtotal	7,049	7,281
Contractual Services and Supplies		
Travel	202	400
Printing and Reproduction	2	2
Subtotal	204	402
Total Program Direction	$ 7,253	$ 7,683

The safeguards and security staff is charged with the following major programmatic areas of responsibility:

- Policy development and implementation, long-range planning, followup action on the resolution of identified site deficiencies, and resource management activities of the Office of Safeguards and Security.
- Oversight assessment of the effectiveness and implementation of safeguards and security policy as it relates to the protection of nuclear-related DOE responsibilities and other designated DOE activities.
- Operational aspects of personnel clearance procedures, actions and policy, as well as the management of the DOE's personnel security clearance program involving the processing and analysis of approximately 31,000 security investigations per year.
- Direction and coordination of Department-wide physical, technical, computer, and operational security programs, as well as document control and protective personnel programs.
- Direction of the technology activities in physical protection and material control and accounting, for international safeguards, and for operational aspects of nuclear material control and accounting.
- Management of the United States "Program of Technical Assistance to International Atomic Energy Agency Safeguards," a reimbursable work program funded at more than $5,000,000 per year from Department of State appropriated funds.

The classification staff is charged with the following major areas of responsibility:

- Technical direction and management of the Classification program; development, issuance and monitoring of classification guides, bulletins, policies and procedures; classification reviews of documents and materials for the public (e.g., Freedom of Information Act and Mandatory Review Requests), other Department elements, other Federal agencies and foreign governments; classification support for congressional activities (testimony and review); development and implementation of a classification education program; and development and maintenance of data management systems on classification reviews, guides, and authorized classifiers.

The nature of the activities supported on this budget do not lend themselves to the traditional cost-benefit analysis. However, activities are conducted in a manner to assure the most effective and efficient use of program resources.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
Construction Project Data Sheet
Atomic Energy Defense Activities - Plant and Capital Equipment
Nuclear Safeguards and Security
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

3. Date A-E Work Initiated: 1st Qtr. FY 1987

3a. Date Physical Construction Begins: 1st Qtr. FY 1988

4. Date Construction Ends: 4th Qtr. FY 1989

5. Previous Cost Estimate: $10,600
Date: September 1985

6. Current Cost Estimate: $10,600
Date: January 1986

7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1987	$ 1,000	$ 1,000	$ 1,000	$ 900
1988	7,000	7,000	7,000	5,400
1989	2,600	2,600	2,600	4,300

8. Brief Physical Description of Project

The Nuclear Safeguards Technology Laboratory (NSTL) will be a unique center for US nuclear safeguards development and application. Los Alamos National Laboratory is responsible for a broad range of advanced safeguards technology and is the lead DOE laboratory for nuclear materials measurement and accountability. The latter emphasizes nondestructive assay (NDA) instrumentation development, safeguards systems analyses, computer-controlled accountability systems development, and the rapid transfer and early implementation of this advanced technology to both the domestic and international nuclear communities. The NSTL will be the center of these activities. It will accommodate approximately 70 people and will consolidate elements of the Nuclear Safeguards Research and Development programs at Los Alamos, which are vital to the development and transfer of safeguards measurement and accounting technology.

The project conforms to the Laboratory Long-Range Site Development Plan and is part of the Five-Year Implementation Plan.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
Construction Project Data Sheet
Atomic Energy Defense Activities - Plant and Capital Equipment
Nuclear Safeguards and Security
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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2. Brief Physical Description of Project (cont)

This facility will consist of a two-story building of approximately 36,800 square feet, including space and provisions for accommodating safeguards training courses that are sometimes attended by uncleared personnel and foreign nationals. It will contain NDA instrument development laboratories, training laboratories, a seminar facility, offices, computer facilities, a conference area, a machine shop, a Category I Special Nuclear Material (SNM) vault, a computer development lab, a controlled testing lab, storage areas, an access shaft and tunnel, and support facilities.

The NSTL will be a Materials Access Area (MAA), and the area surrounding the building will be included in a protected area (PA). However, the building is designed to facilitate removal of the Safeguards Training Lab and Auditorium from the security area when required for training of uncleared citizens and foreign nationals. Under this arrangement, however, the NSTL will not be subject to public access at any time.

The building will employ a structural space frame system of construction using the most cost-effective materials available to allow the maximum open area and flexibility. A minimal-maintenance building envelope will be used for the exterior finish. The interior design will utilize flexible office and laboratory systems for the most efficient use of space, and access floors to provide maximum flexibility for data distribution, communication, power, and mechanical systems.

Programmed office space for this facility requires an average net area of approximately 64 square feet per person.

The building was re-sited from TA-35 to TA-55 because of security requirements that resulted in the incorporation of a security access shaft, tunnel, elevator, and basement corridor and adjustments to the new site geography.

Site work will include appropriate vehicular access, sidewalks, curbs and gutters, landscaping, drainage, and erosion control. Staff, government, service, and visitor vehicular access will be over a paved road to Pecos Drive. Parking will be provided for 80 vehicles. Utilities will include relatively short service hook-ups for electrical power, telephone, water, and natural gas. A sewage lift station and force main will be required to tie into the existing sanitary sewer. Access to the site will be controlled by a security guard station and the extension of the existing TA-55 perimeter security system.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
Construction Project Data Sheet
Atomic Energy Defense Activities - Plant and Capital Equipment
Nuclear Safeguards and Security
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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8. Brief Physical Description of Project (cont)

As this project is located in an area that is not served by one of the existing central energy systems, it will have a natural-gas-fired hot water boiler, which can be readily modified to interface with more efficient future central energy distribution systems.

The overall energy consumption of this facility will be minimized with energy conservation considerations, including insulation, building orientation, passive solar features, heat recovery, economy-cycle cooling, night and weekend setback/ shutdown, and energy-efficient electrical and mechanical systems.

Energy conservation features and systems will be integrated into the preliminary design (Title I) in accordance with the General Design Criteria Manual, DOE 6430.1.

Summer temperatures and humidity control will be provided for the computer rooms, laboratories, darkrooms, lecture and conference rooms, and auditorium by mechanical refrigeration. Evaporative cooling will provide summer temperature control for the offices. Mechanical ventilation will be provided for the shop, equipment rooms, and rest rooms. Soldering hoods will be required for the machine shop. An absolute filtration and exhaust system will be provided for the laboratory glove box.

Power will be distributed throughout the building at 208Y/120 volts and 480Y/120 volts. The building will be equipped with a telephone system, a protected wireline, and an intrusion detection system. Fire protection will be provided by a hydraulically designed wet pipe sprinkler. Plumbing and piping systems will consist of heating hot water, potable hot and cold water, industrial hot and cold water, sanitary sewer, roof drain, compressed air, natural gas, and circulating cooling water.

Standard equipment will include office and laboratory furnishings, machine shop equipment, computer terminals, dark room equipment, audio/visual equipment, and auditorium, dining, reception and library furnishings.

The requested FY 1987 funding will be used for Title I and Title II design of the building.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
Construction Project Data Sheet
Atomic Energy Defense Activities - Plant and Capital Equipment
Nuclear Safeguards and Security
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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9. Purpose, Justification of Need for, and Scope of Project

The purpose of this project is to provide a new facility that will significantly reduce the transportation of Special Nuclear Material (SNM) between sites, thereby improving the security of SNM at the Laboratory, and will minimize creation of temporary material access areas in current facilities. It will provide space in a secure area for safeguards system design and analyses, the results of which often are classified. This facility will provide centralized instrumentation development laboratories specifically designed for safeguards requirements, urgently needed space for the development, testing, and evaluation of measurement and accountability systems for implementation in DOE nuclear facilities, and facilities to support rapid transfer of advanced safeguards technology to the nuclear community and the International Atomic Energy Agency (IAEA). The facility will consolidate principal activities of the Nuclear Safeguards Research and Development programs at the Los Alamos National Laboratory and will alleviate conditions of wide dispersion, overcrowding, and deterioration.

The widespread use of nuclear materials requires the development of systems to: (1) safeguard against terrorist nuclear threat and blackmail; (2) provide nuclear materials accountability by perfecting fail-safe methods to track and inventory SNM; and (3) enhance the nuclear community's ability to control and respond to nuclear problems worldwide. The Los Alamos National Laboratory is responsible for a broad range of advanced safeguards technology and is the lead DOE laboratory for nuclear materials measurement and accountability. The latter emphasizes nondestructive assay instrumentation development, safeguards systems analyses, computer-controlled accountability systems development, and the rapid transfer and early implementation of this advanced technology to both the domestic and international nuclear communities. The NSTL will be the center of these activities and will provide:

a. centralized instrumentation development laboratory facilities that are specifically designed for safeguards requirements;

b. space for the development, testing, and evaluation of measurement and accountability systems for implementation in DOE nuclear facilities; and

c. facilities to support our responsibilities for speedy and effective transfer of advanced safeguards technology to the nuclear community.

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FY 1987 CONGRESSIONAL BUDGET REQUEST
Construction Project Data Sheet
Atomic Energy Defense Activities - Plant and Capital Equipment
Nuclear Safeguards and Security
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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9. Purpose, Justification of Need for, and Scope of Project (cont)

The NSTL will be sited at TA-55, the Plutonium Processing Facility site, and near the existing safeguards locations. The proximity of these facilities will enhance ongoing safeguards research, development, test, and evaluation (RDT&E), including the continuing activities at the Plutonium Processing Facility and the demonstration of its accountability system to Defense Programs organizations.

The principal activities of the Los Alamos Safeguards Program, which is sponsored almost entirely by the DOE, include the following: (1) RDT&E of advanced measurement and accounting systems for rapid control and inventory of nuclear materials in DOE nuclear facilities; (2) implementation of such systems in existing and planned DOE nuclear facilities; (3) development of high-sensitivity detection and identification instruments; (4) response to local measurement needs of the Office of Military Application's special materials projects, and assistance in safeguards as required by DOE Order 5630.2; (5) development of measurement instrumentation and safeguards systems analyses for international safeguards, under the DOE-managed Program of Technical Assistance (POTAS) to the IAEA; and (6) the operation of the Safeguards Technology Training Program for the DOE. For the past 4 years, Los Alamos also has conducted training courses in States' Systems of Accounting and Control for the DOE and the IAEA, under the mandate of the Nuclear Non-Proliferation Act of 1978.

The United States is committed, through the State Department, the President, and the Congress, to support the IAEA in personnel exchanges, technology exchanges, and inspector training. Because the IAEA inspection staff is drawn from member states (some of which are Soviet Bloc) with different political views and security interests from those of the United States, it is not possible to allow unlimited access of the inspectors into actual United States operating nuclear facilities to receive technical training using United States nuclear materials. Therefore, it is necessary for the United States, in its continuing efforts to support the IAEA, to maintain a facility that can be used to access control these IAEA inspectors without allowing the potential compromise of classified information or access to sensitive nuclear materials.

The NSTL will provide the requisite facility, properly protected to meet the DOE requirements, which can be used as a controlled training laboratory for these IAEA inspectors and would allow the United States Government to meet its commitments to the Department of State, the President, the Congress, and the IAEA. Although the NSTL will be an MAA and the area surrounding the building will be a PA, the building is designed to permit removal of the Safeguards Training Lab and

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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9. Purpose, Justification of Need for, and Scope of Project (cont)

Auditorium from the security area when required for training of IAEA personnel. Under this arrangement, however, the NSTL will not be subject to public access at any time.

Recent events have focused national attention on the importance of nuclear safeguards and the urgency of improving the capability of safeguards systems throughout the DOE nuclear facilities. The Los Alamos Safeguards Program is responsible for developing, testing, and implementing advanced measurement and accountability systems at several DOE facilities now under construction (for example, the Naval Fuel Materials Facility and the New Special Recovery Facility at Savannah River) as well as nearly all currently operating DOE facilities. With the anticipated future construction of both uranium and plutonium Laser Isotope Separation (LIS) enrichment facilities as well as increased emphasis on improved safeguards in existing DOE facilities, the need for such support to DOE facilities and the nuclear community at large will continue to grow throughout the foreseeable future. The associated RDT&E requires large amounts of contiguous development laboratory space not now available: current efforts are fragmented and distributed over a collection of inadequate, makeshift labs. The NSTL will permit consolidation of these urgently needed systems development activities.

The Safeguards Training Program, which is the principal means for rapid transfer of measurement and accounting technology to the nuclear community, is especially hampered by the lack of adequate training laboratories. Most courses require "hands-on" instrumentation laboratory training, which is accomplished by breaking the classes into small laboratory groups. To accommodate the several groups, staff offices are converted on a temporary basis to training laboratories, which is wasteful and inconvenient for the personnel involved.

Portions of the Safeguards Technology Training Program activities and other technology transfer functions must be in areas accessible to uncleared domestic, foreign and IAEA visitors. As many as 200 persons attend the training courses each year, and a comparable number of persons come at various times to discuss and learn about the specific areas of safeguards technology.

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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9. Purpose, Justification of Need for, and Scope of Project (cont)

The NSTL can help solve this problem and allow the possibility of including selected space to be enclosed in a security area. Locating a portion of the facilities at TA-55 in a security area would allow the program to accommodate changes in classification guidance.

Personnel in the program currently number about 100 spread throughout numerous buildings and trailers in 2 technical areas separated by 4 miles. Approximately one-half are located at Ten Site (TA-35) in Building 27, a structure originally built to house a test reactor and not suited for office and/or laboratory space. Others are located in parts of Building 2 and in three trailers and two transportable buildings at TA-35. Other organizations housed in Building 2 include parts of P (Physics), CHM (Chemistry), MST (Materials Science and Technology) and LS (Life Sciences) Divisions, with the Safeguards Program occupying approximately 20% of the usable building area.

Current "maximum Packing" in the available assortment of ill-suited space, reactor pits, accelerator bays, and trailers is detrimental to both morale and productivity of the Los Alamos Safeguards Program. Furthermore, some of this space, such as the high-bay area in Building 27, TA-35, which is equipped with a 50-ton bridge crane, was modified to alleviate acute safeguards space problems at the sacrifice of its special capability. The NSTL will allow this capital-intensive space to be made available for more efficient use by the Laboratory.

The possibility of obtaining additional space in TA-35 facilities has been explored. This site is shared with another major program, laser fusion, which also ranks high in national priorities. The Laser Program, like Safeguards, has increased its personnel levels and has constructed a new, large, high-energy facility and a target fabrication facility on this site. In short, virtually all existing space at TA-35 is committed.

Consideration has been given to moving a portion of the safeguards staff to another site, if suitable space be came available. Such a move would further fragment safeguards staff and be detrimental to the overall programmatic effort; furthermore, no suitable space has become available or can be expected.

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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9. Purpose, Justification of Need for, and Scope of Project (cont)

The short-term space deficits will continue to be met by the lease of office trailers located in the vicinity of Buildings 2 and 27 at TA-35. This action must be considered as a temporary remedy, since it does not provide needed laboratory space, further scatters the safeguards staff, and in no way alleviates the existing inefficient conditions.

The NSTL construction project is the best and, at this time, the only available solution to the acute and deteriorating space problem that has existed for more than 5 years for the Los Alamos Safeguards Program.

During this period, the marked growth in both program scope and personnel was accommodated by trailers and temporary structures, resulting in an undesirable mix of laboratory and office areas and overcrowded work areas.

Without funding for this construction project, these extremely important safeguards programs will continue to be adversely affected. The requested facility will eliminate conditions of wide dispersion, overcrowding, and deterioration; reduce the transportation of SNM between sites; and provide necessary unclassified and classified facilities.

This project will allow consolidation of two security areas. In addition, the SNM used in this area will not be exposed to public access roads because of reduced intrasite shipments.

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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10. Details of Cost Estimate*

a. Engineering, design, and inspection based on 16% of constructions costs**		$ 1,120
b. Construction Costs		7,050
(1) Improvements to land, including general site work, security fence, roads, parking, walks, and landscaping	$ 845	
(2) Building: Laboratory-Office building, 36,800 sq. ft. at approximately $147/sq.ft.	5,420	
(3) Other Structures - tunnel and entrance	625	
(4) Special Facilities	0	
(5) Utilities, including fire and potable water service, sanitary sewer, natural gas, electrical power, and data and communications service lines	160	
c. Standard Equipment - laboratory and office furnishings		880
Subtotal		9,050
d. Contingency at approximately 17% of above costs***		1,550
Total project cost		$10,600

* The estimate is based on a conceptual design that is complete. The Laboratory is using escalation rates of 4.9% for CY 1985, 6.4% for CY 1986, 6.7% for CY 1987, 6.5% for CY 1988, and 6.9% for CY 1989. These rates were forecasted using "Data Resources Incorporated" forecasting services. These services were contracted by the DOE.

** Cost-of-services were estimated for engineering, design, and inspection from historical records and experience with manhour requirements established for each discipline.

*** Contingencies were analyzed and applied to items based on the uncertainties of the development at the conceptual level.

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

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11. Methods of Performance

Design and inspection will be performed under a negotiated architect-engineer contract. Project management and engineering support will be provided by the operating contractor. Construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bids.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1987	FY 1988	FY 1989	Total
a. Total Project Funding					
(1) Total Facility Costs					
(a) Construction Line Item..........	$ 0	$ 900	$ 5,400	$ 4,300	$10,600
(b) P E & D..........................	0	0	0	0	0
(c) Expense Funded Equipment.........	0	0	0	0	0
(d) Inventories......................	0	0	0	0	0
Total Facility Costs..........	$ 0	$ 900	$ 5,400	$ 4,300	$10,600
(2) Other Project Funding					
(a) Conceptual Design................	$ 190	$ 0	$ 0	$ 0	$ 190
(b) Other Project-Related Costs......	0	0	0	0	0
Total Other Project Funding....	$ 190	$ 0	$ 0	$ 0	$ 190
Total Project Funding........... (Item 1 and Item 2)	$ 190	$ 900	$ 5,400	$ 4,300	$10,790

b. Total Related Funding Requirements (Estimated Life of Project: 25 years)	
(1) Facility Operating Costs..	$ 466
(2) Programmatic Operating Expenses Directly Related to the Facility..........	0
(3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility..........	0
(4) GPP or Other Construction Related to Programmatic Effort in the Facility..........	0
(5) Other Costs..	0
Total Other Related Annual Funding Requirements..........	$ 466

DEPARTMENT OF ENERGY
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Construction Project Data Sheet
Atomic Energy Defense Activities - Plant and Capital Equipment
Nuclear Safeguards and Security
(Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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13. Narrative Explanation of Total Project Funding and Other Related Requirements

a. Total Project Funding

(1) Total facility costs. No narrative is required.

(2) Other project funding.

(a) Conceptual design costs. No R&D will be required.

(b) No other project-related funding will be requested.

b. Total Related Funding Requirements

(1) Facility operating costs.

This category includes maintenance, janitorial, and utilities calculated from FY 1984 costs on a per-square-foot basis throughout the Laboratory and projected to FY 1990. Five percent escalation per year for FY 1985, ten percent escalation for FY 1986, seven percent escalation per year for FY 1987, five percent escalation for FY 1988, and seven point five percent escalation for 1989 was used on maintenance and janitorial base costs, and ten point five percent escalation per year for FY 1985, FY 1986, FY 1987, FY 1988, and FY 1989 was used for utilities. This procedure yields an FY 1990 maintenance cost of $3.49/sq.ft., a janitorial cost of $1.99/sq.ft., and a utilities cost of $7.18/sq.ft. for a total of $12.66/sq.ft./yr. The product of $12.66 and 36,800 square feet, the area of the building, is approximately $466,000.

(2) Programmatic operating expenses directly related to the facility.

All personnel operating this facility will be relocated from various sites throughout the Laboratory, therefore, there will be no incremental increase in the programmatic operating expenses directly related to this facility.

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Atomic Energy Defense Activities - Plant and Capital Equipment
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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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13. Narrative Explanation of Total Project Funding and Other Related Requirements (cont)

(3) Capital equipment not related to construction but related to the programmatic effort in the facility.

None anticipated.

(4) GPP or other construction related to programmatic effort.

None anticipated.

(5) Other costs.

None anticipated.

14. Incorporation of Fallout Shelters

Fallout shelter space will not be provided under this project as there is sufficient space in Los Alamos to accommodate the population.

15. Federal Compliance with Pollution Control Standards

The total cost of this project includes the costs of these measures necessary to assure compliance with Executive Order 12088. Sanitary wastes will be discharged to an existing sanitary sewer that is connected to adequate sewage treatment facilities. Where potential airborne contaminants exist, ventilation and process air leaving the building are subjected to filtration to give maximum practicable reduction in quantities emitted and to provide emissions below applicable standards. Contaminated waterborne waste will be disposed of at the Laboratory contaminated waste treatment facility.

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1. Title and Location of Project: Nuclear safeguards technology laboratory, Los Alamos, New Mexico

2. Project Number: 86-D-186

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16. Evaluation of Flood Hazards

The components of this project are located in an area not subject to flooding, as determined in accordance with Executive Order 11988.

17. Environmental Impact

Information on this proposed project and pertinent environmental factors were submitted to DOE Headquarters on April 2, 1985, in the form of an action description document. This information is provided for Headquarters use in determining the need for further documentation.

This proposed construction project will not be located in a floodplain or wetland, and no wetland assessment is required.

18. Accessibility for the Handicapped

The total cost of this project includes the cost of construction necessary to make the new facility accessible to the handicapped, in accordance with the Architectural Barriers Act Public Law 90-480, and the implementing instructions in the Federal Property Management Regulations (41CFR101.19.6). The proposed facility will not be accessible to the public. Provisions will be made for handicapped employees to use the proposed facilities.

Security Investigations

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
SECURITY INVESTIGATIONS
ATOMIC ENERGY DEFENSE ACTIVITIES

(Tabular dollars in thousands. Narrative material in whole dollars)

	FY 1985 Appropriation	FY 1986 Adjusted Appropriation	FY 1987 Base	FY 1987 Request	Request Vs.Base
Security Investigations (DP)					
Operating Expenses.........	$34,000	$32,200	$32,200	$33,300	$+1,100
Security Investigations......	$34,000	$32,200 a/b/	$32,200	$33,300	$+1,100
Staffing Total FTE's.........	N/A	N/A	N/A	N/A	N/A

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a/ Reflects a general reduction of $200,000.

b/ Reflects $1,000,000 sequestered to comply with the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).

Authorization: Section 31, P.L. 83-703

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Confer.	General Reduction	Gramm-Rudman-Hollings	Subtotal	Comparability Adjustments	Adjusted Approp. Total
Security Investigations (DP)						
Operating Expenses	$ 33,400	$ -200	$-1,000	$ 32,200	$ -	$ 32,200
General Reduction	-200	+200	-	-	-	-
Total, Security Investigations	$ 33,200	$ 0	$-1,000	$ 32,200	$ -	$ 32,200

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
Security Investigations

(Tabular dollars in thousands. Narrative material in whole dollars.)

FY 1986 Adjusted Appropriation/FY 1987 Base	$ 32,200
OPM increased by approximately 443 cases from FY 1986 @ $1,625	+ 720
FBI increased by approximately 200 cases from FY 1986 @ $1,850	+ 371
NAC increased by approximately 900 cases @ $10	+ 9
FY 1987 Request	$ 33,300

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
Security Investigations

(Tabular dollars in thousands. Narrative material in whole dollars.)

Program Overview

The objective of the Security Investigations Program is to insure that the common defense and security of the United States will not be endangered by the granting of security clearances to DOE and DOE contractor personnel who, in the performance of their work, must have access to Restricted Data, National Security Information, or Special Nuclear Material, or who occupy a designated Critical Sensitive position.

Recent clearance support has been sufficient to provide for DOE and contractor needs. Approximately 30,764 security investigations will be performed in FY 1987, an increase of 1,542 investigations above FY 1986.

Justification

The FY 1987 request for the Security Investigations Program is $33,300,000, an increase of $1,100,000 above the FY 1986 adjusted appropriation. This amount will provide DOE with approximately 30,764 security investigations (20,164 Full-Field Background Investigations and 10,600 National Agency Checks). The estimated cost for a Federal Bureau of Investigation Full-Field Background Investigation is $1,850, no change from FY 1986. The estimated cost of the Office of Personnel Management investigation is $1,625, no change from the FY 1986 estimate. The $33,300,000 should adequately support projected FY 1987 requirements for all DOE and DOE contractor personnel requiring security clearances.

A tabulation of programmatic areas that are supported and the FY 1986 and FY 1987 funding levels follows:

	FY 1986 Adjusted Appropriation		FY 1987 Request	
	Cases	Amount	Cases	Amount
Programs				
Defense Program Activities........	21,328	$24,705	21,715	$24,833
Other DOE Activities				
Uranium Enrichment............	4,147	4,652	3,475	3,908
Nuclear Energy................	3,279	2,259	4,392	3,515
Other.........................	468	584	1,182	1,044
Total Other DOE...........	7,894	7,495	9,049	8,467
Total.................	29,222	$32,200	30,764	$33,300

Below is a summary tabulation of security clearance requirements for FY 1986 and FY 1987:

	FY 1986 Adjusted Request		FY 1987 Request	
	Full Field	NAC	Full Field	NAC
Programs				
Defense Program Activities.......	14,949	6,379	15,001	6,714
Other DOE Activities				
Uranium Enrichment...........	2,852	1,295	2,396	1,079
Nuclear Energy...............	1,366	1,913	2,131	2,261
Other........................	355	113	636	546
Total Other DOE..........	4,573	3,321	5,163	3,886
Total................	19,522	9,700	20,164	10,600

The Atomic Energy Act of 1954, as amended, and Executive Orders 10450 and 10865 require that background investigations be conducted on all persons prior to being granted access to classified information, material, facilities or special nuclear material. Such investigations must be conducted by either the Federal Bureau of Investigation or the Office of Personnel Management.

Naval Reactors
Development

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
NAVAL REACTORS DEVELOPMENT

ATOMIC ENERGY DEFENSE ACTIVITIES
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Appropriation	FY 1986 Adjusted Appropriation	FY 1987 Base	FY 1987 Request	Request vs Base
Plant Development					
Operating Expenses ..	$ 62,300	$ 62,500	$ 62,500	$ 71,000	$+ 8,500
Subtotal	62,300	62,500	62,500	71,000	+ 8,500
Reactor Development					
Operating Expenses ..	229,300	251,700	251,700	274,000	+22,300
Capital Equipment ..	22,500	25,300	25,300	51,700	+26,400
Construction	48,000	46,270	46,270	12,100	-34,170
Subtotal	299,800	323,270	323,270	337,800	+14,530
Reactor Operation and Evaluation					
Operating Expenses ..	122,000	139,000	139,000	173,000	+34,000
Subtotal	122,000	139,000	139,000	173,000	+34,000
Program Direction					
Operating Expenses...	11,200	10,923[b]	10,923	11,800	+ 877
Subtotal	11,200	10,923	10,923	11,800	+ 877
Total					
Operating Expenses...	424,800	464,123	464,123	529,800	+65,677
Capital Equipment....	22,500	25,300	25,300	51,700	+26,400
Construction	48,000	46,270	46,270	12,100	-34,170
Total Naval Reactors Development	$495,300[a]	$ 535,693[c]	$535,693[c]	$593,600	+57,907
Staffing Total FTE's...	194	213	213	213	-

Authorization: Section 31, P.L. 83-703

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[a] Reflects a management initiative reduction of $1,600,000.

[b] Reflects proposed appropriation transfer of $166,000 to Departmental Administration for general FTE clerical reductions.

[c] Reflects $27,641,000 sequestured to comply with the Balanced Budget and Emergency Deficit Control Act of 1985 (P. L. 99-177).

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Confer.	FTE General Reduction	Gramm-Rudman-Hollings	Subtotal	Comparability Adjustments	Adjusted Approp. Total
Naval Reactors Development (NE)						
Plant Development						
Operating Expenses	$ 66,000	$ -	$ -3,500	$ 62,500	$ -	$ 62,500
Subtotal	66,000	-	-3,500	62,500	-	62,500
Reactor Development						
Operating Expenses	261,300	-	-9,600	251,700	-	251,700
Construction	46,500	-	-230	46,270	-	46,270
Subtotal	307,800	-	-9,830	297,970	-	297,970
Reactor Operation and Evaluation						
Operating Expenses	150,000	-	-11,000	139,000	-	139,000
Subtotal	150,000	-	-11,000	139,000	-	139,000
Capital Equipment	28,000	-	-2,700	25,300	-	25,300
Subtotal	28,000	-	-2,700	25,300	-	25,300
Program Direction	11,700	-166	-611	10,923	-	10,923
Subtotal, Naval Reactors Dev.	563,500	-166	-27,641	535,693	-	535,693
Total, Naval Reactors Development	$ 563,500	$ -166	$-27,641	$ 535,693	$ -	$ 535,693
Operating Expenses	489,000	-166	-24,711	464,123	-	464,123
Capital Equipment	28,000	-	-2,700	25,300	-	25,300
Construction	46,500	-	-230	46,270	-	46,270

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
ATOMIC ENERGY DEFENSE ACTIVITIES
NAVAL REACTORS DEVELOPMENT
(In thousands of dollars)

FY 1986 Adjusted Appropriation/FY 1987 Base................................$535,693

Plant Development

- Escalation and facility decontamination..............................+ 8,500

Reactor Development

- Escalation, INEL Advanced Test Reactor beryllium shield and fuel requirements, and Advanced Fleet Reactor work, offset by the net change in plant and equipment category - an increase in capital funds for prototype plant and data processing equipment and a decrease in construction funds as FY 1986 was the last year for funding the fuel factory, prototype modifications, and ATR reactor modifications projects ....+14,530

Reactor Operation and Evaluation

- Escalation and increase in the number of prototype plants requiring service ....+34,000

Program Direction

- Escalation and other expenses ....+ 877

FY 1987 BUDGET REQUEST $593,600

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

PROGRAM OVERVIEW
Naval Reactors Development

I. Program Overview

For Fiscal Year 1987 the Naval Reactors Development budget request is $593.6 million. These funds provide for continuing the work in the areas described below. The $57.9 million increase over the Fiscal Year 1986 adjusted appropriation consists of escalation, additional prototype plants requiring service, Idaho Test Reactor beryllium shield changeout and fuel requirements, and Advanced Fleet Reactor work.

Over 40 percent of the Navy's combatant vessels are nuclear powered, including the ballistic missile submarines which constitute the most survivable leg in the strategic defense triad, attack submarines which provide the most viable check against the seaborne nuclear threat of potential adversaries, and aircraft carriers and cruisers which provide unparalleled power projection capabilities. Nuclear propulsion provides operational flexibility not possible with fossil fueled ships.

The purpose of the Naval Reactors Development effort is to develop naval nuclear reactor plants and cores which will improve the performance and enhance safe operation of these ships, both now and in the future. The objective is to couple enhanced performance with simplified plant operating and maintenance requirements and improved plant safety and reliability.

Nuclear reactor plant advances are sought in: power quieting, lifetime, and survivability. Development of high power reactor plants allows increased ship performance. Reducing propulsion plant weight has the added benefit of reducing volume necessary for buoyancy in a submarine. Additionally, improved power increases the ability to alter ship speeds quickly over wide ranges thus providing a tactical advantage. Reducing the noise generated by a reactor plant is essential to reducing the detectability of a submarine. Responsiveness, ruggedness and, for submarines, quietness are keys to enhancing a warship's combat effectiveness. Longer life reactors require fewer refuelings thus reducing costs, generating less radioactive waste material, and increasing ship availability for front line duty.

As the number and average age of nuclear powered warships continues to grow, additional effort is given to improving operating plants. Work is necessary to assess and evaluate material and nuclear performance, ensure safety, understand and deal with long term phenomena, and to develop improved cores and components. Operating data obtained from equipment in the fleet is a valuable data source for new development.

Major work includes: the Advanced Fleet Reactor which will concentrate many of the current advances in reactor concepts, components and materials to power the new SSN-21 Class of nuclear powered attack submarines; a Modified Fuel Process for use in producing advanced fuel elements which will allow further flexibility in core and fuel design to increase reactor power and endurance; and a Developmental Materials Core to test and evaluate new materials and under prototypic conditions. Other ongoing development efforts will continue, including development and testing of: advanced materials for use in reactor plant components, systems and cores; production processes and techniques capable of efficiently and consistently manufacturing advanced material and components; new plant, components, and systems concepts; and advanced analytic techniques to facilitate investigation and analysis of future and existing cores and components.

New designs and components undergo extensive testing before and during fleet application. Operation of eight land based nuclear prototype plants and the Advanced Test Reactor provide long term testing of materials, components and cores and empirical data on plant performance ahead of fleet experience, allowing for determination and resolution of any problems before they are encountered in the fleet. These plants are vital developmental tools. The prototype plants have the added benefit of being used to train Navy nuclear plant operators. Maintaining and upgrading these plants is therefore important to accomplishing programmatic goals.

I. Reactor Development

	FY 1986 Adjusted Appropriation	FY 1987 Request
Operating Expenses	$251,700	$274,000
Capital Equipment	25,300	51,700
Construction	46,270	12,100
TOTAL	$323,270	$337,800

Reactor Development work improves the power, reliability, and endurance of naval reactors through the development of improved fuel and poison systems and advanced reactor concepts and components. Better design and manufacturing techniques also aid in developing reactors which meet the continually increasing demands of the Navy's nuclear-powered fleet. An extensive development and testing program is carried out to develop new materials and to ensure existing materials perform as required in the harsh reactor environment.

Development of higher density fuel and poison elements is of central importance. These elements must be capable of maintaining their integrity for long periods of time under the harsh environmental conditions inherent in higher power, longer operating life cores. Core development requires accommodating changes in other reactor features such as advanced control rod materials and control concepts. To provide an integrated system, work also involves the design and development of other reactor components such as core barrels, closure heads, and vessels. Prototype cores and components are fabricated and tested in the land-based prototype naval nuclear propulsion plants under actual operating conditions.

Reactor plant design optimization is a complex and exacting process. Analytic models which predict and simulate material and component behavior are indispensable in efficient and cost-effective design and evaluation processes. Examination of spent cores provides valuable data on material and reactor performance under actual operating conditions. These data are used to revise design assumptions and improve analytic models.

Reactor Development is broken down into five major categories: (a) Core Examination; (b) Materials Development; (c) Nuclear Design and Analysis; (d) Reactor Process Development; and (e) Reactor Technology.

a. Core Examination

Core examination work involves disassembly and examination of expended cores from operating naval reactors. This work also includes examination of associated components and evaluation of irradiated test specimens from the Advanced Test Reactor. The majority of the Core Examination work is performed at the Expended Core Facility in Idaho with other work being conducted at the Bettis and Knolls Atomic Power Laboratories.

Every naval nuclear reactor plant has a unique operational history. Variables such as hours of operation, percentage of time at full power, operating temperatures, and water chemistries combine to create unique operating parameters for each reactor. Examinations of material removed from operating reactors coupled with knowledge of reactor operational histories provide invaluable empirical data on material and component performance over a wide range of environmental and operational parameters.

Data generated from core examinations, are integral to understanding and evaluating the relationship between material and component performance and various operating environments. Understanding and defining these relationships is an important factor in directing material and fuel development work, designing future cores and reactors, and determining operating guidelines for naval reactors.

Examination of expended cores and other irradiated materials will continue during FY 1987, with specific work including: (1) disassembly and examination of fuel, cladding, and structural materials to obtain information on material properties with respect to radiation, corrosion and wear; (2) examination of expended cores to evaluate performance and post-operational core component condition; (3) determination of fuel depletion rates; (4) disposition of prototype cores; and (5) examination and testing of control rod drive mechanisms to confirm condition after reactor operation.

b. Material Development

Improving material performance is an integral step in achieving the Program's objective of enhancing reactor plant performance, longevity, reliability, and safety. Work under Material Development includes development of high integrity nuclear fuels, poisons, cladding, and structural materials capable of achieving desired reactor plant performance.

Material Development begins with research into new materials. Materials demonstrating desirable characteristics are produced with pilot-scale laboratory processes to determine production viability. Laboratory specimens are irradiated in the Advanced Test Reactor and are then examined for dimensional change, structural integrity and corrosion properties. The most promising materials are then used in prototype cores and fully tested in reactor plants. Data on fuel and poison material properties obtained from irradiation and prototype tests are incorporated into design specifications and guidelines to ensure future core designs accommodate and take advantage of material behavior properties. Development of a number of reactor plant materials often proceeds in parallel to realize maximum plant performance gains.

Irradiation testing is a vital portion of the material development effort. Laboratory analysis and limited testing will predict material response to various operating stimuli, however only in an operating reactor can these predictions be verified. The Advanced Test Reactor in Idaho has a number of independently variable test loops which allow irradiation testing of a number of different materials under a variety of temperature and radiation conditions, thus allowing rigorous examination to select the most advantageous materials to commit to long term comprehensive testing in prototype cores.

Material process development is an important area. Performance gains in existing materials can sometimes be achieved through improved production processes, while the acceptability of a new material for use in naval reactors is dependent upon the cost and feasiblity of full scale production. Material process development involves translating laboratory manufacturing techniques and processes into full scale production methods.

Existing materials are continuously evaluated and tested to confirm design assumptions and to understand emergent problems. These evaluations provide considerable amounts of information regarding the actual operational performance of materials over long periods of time. Data gained from these examinations are factored into material development programs, production methods, design specifications and reactor plant operating procedures.

Sophisticated modeling and analysis techniques are used during material development, qualification and testing. These techniques allow prediction of material performance, and are used to establish reactor performance limits.

During Fiscal Year 1987 Naval Reactors will: (1) select an advanced fuel element manufacturing process for irradiation qualification and vendor development; (2) develop, test, and evaluate new and current fuel, poison, cladding, and core structural materials; (3) provide technical guidance to reactor core and component suppliers; (4) continue to develop and qualify new material models and fuel system analysis methods; and (5) define the material properties of advanced cladding materials to provide a database for use in naval nuclear design.

c. Nuclear Design and Analysis

Nuclear Design and Analysis work provides for research and development in the fields of reactor physics, nuclear design and fuel loading of improved reactor cores, and analysis and testing of operating reactors. Naval Reactors also performs reactor shielding design and analysis work, safety analyses of reactor plants and development of improved fuel handling techniques under this portion of Reactor Development.

The ultimate objective of physics design and analysis of naval reactor cores is to develop core designs which meet all operational requirements while optimizing core depletion rates and minimizing adverse material conditions in the reactor. The performance of a reactor core depends on a multitude of factors. Understanding the relationships between these various factors and core performance is therefore crucial to predicting a reactor's operating parameters and the potential limits of its performance.

The work begins with development of analytic models based on research and operating experience. The models are simulated via computer programs and confirmed by test data and data from operating plants. Detailed critical experiments mock up and test advanced core fuel and poison compositions and core geometries. These experimental data are used to establish core fuel and poison loadings and performance predictions. Operating data confirms analytic methods and is used to evaluate performance of the core with respect to design parameters.

During Fiscal Year 1987, Naval Reactors will: (1) complete nuclear engineering for D2W Modified Fuel Process core production; (2) perform physics analysis for the Submarine Test Core acceptance test; (3) continue Advanced Fleet Reactor (AFR) experiments and analyze AFR experiments; (4) analyze advanced reactor concepts for potential shipboard application; and (5) develop and qualify more accurate and efficient procedures and techniques to support physics and nuclear design work.

Reactor plant shielding is an important factor in controlling radiation and in overall plant weight. Work in this area includes: shield surveys of operating plants to ensure that radiation levels are within design specifications and guidelines; and developing, testing, and certifying improved, lighter weight shielding designs and materials.

During FY 1987, Naval Reactors will: (1) provide radiation level evaluations and shield design support for existing and new refueling equipment; (2) evaluate the use of new shielding materials for prototype application; (3) develop a conceptual shield design compatible with the Advanced Fleet Reactor plant and determine shield design modifications to accommodate the Advanced Fleet Reactor in an operating prototype; and (4) continue to evaluate and qualify new methods and data base information to maintain state-of-the-art shield design technology.

The safety analysis effort is a key factor in ensuring safe operation of existing reactor plants and proper design of those on the drawing board. Work in this area involves developing computer codes that predict reactor conditions during and after postulated reactor plant accidents. Results are analyzed and aid in the development of improved equipment and procedures. This analysis is also used to characterize current reactor plant conditions. Based on operating histories, key plant parameters are established and form the basis for future allowable reactor operating limits.

Another element of the safety analysis program is control of special nuclear material. Handling procedures are developed and monitored to prevent unsafe material configurations during transport and storage. Additionally, material movement and storage locations are meticulously tracked to ensure strict accountability.

During Fiscal Year 1987, the safety analysis program will: (1) continue to provide centralized material control and accountability, safeguard training, procedures, and qualification for areas authorized to hold nuclear material; (2) develop and qualify loss-of-coolant casualty analysis methods; (3) complete thermal analysis of spent fuel handling; (4) develop improved models and methods for safety analysis of reactor plants; and (5) maintain nuclear accountability and standards for all fuel handling operations.

Nuclear Design and Analysis work is heavily dependent upon complex highly sophisticated computer codes. Work will continue to make existing codes more efficient and representative of reactor characteristics, and in developing new codes. The capabilities of computing resources can be a limiting factor. In Fiscal Year 1987 the Naval Reactors Development program will continue updating its scientific computing resources with the addition of a scientific computer system at one laboratory. Considerable effort will be required to convert existing computer codes to the new computer systems.

d. Reactor Technology

Reactor Technology work focuses on designing new and innovative reactor features which will achieve the objectives of higher power, longer life and more reliable naval reactors. Work is accomplished through a four-step process: (1) design of reactor components meeting functional requirements; (2) analysis of components to demonstrate acceptable performance; (3) manufacture of developmental components and testing of them to ensure they function according to design; and (4) advanced technology development aimed at solving complex problems in the areas of nuclear analysis, thermal performance and hydraulics, structural mechanics, corrosion, fatigue, noise, shock, and vibration.

Reactor features and characteristics depend on the physical properties of individual reactor components. These components include reactor cores and support structures, pressure vessels and closure heads, core barrel assemblies, control rod drive mechanisms and core instrumentation equipment. Acceptability of component design is determined by how well the design balances the competing requirements of performance, serviceability and reliability. Thermal, hydraulic, and structural analyses of individual components and system configurations are used to characterize the effects of temperature, pressure, flow, fatigue, shock, and vibration on the components and systems. Integral to this effort is computer simulation of operational conditions and testing of components and systems currently in operation.

Performance predictions generated during the analysis phase of Reactor Technology work are evaluated and verified in full-scale model testing. Developmental components are fabricated and installed in prototype naval reactor plants, allowing component performance to be measured in an operating environment. Additionally, developmental components and full scale mockups are assembled in test loops enabling researchers to isolate and test specific component and system attributes such as noise generation, vibration and shock resistance, and heat transfer characteristics. Data from these tests form the basis for design refinements, qualification, and fabrication release to vendors. These data are also used to update design manuals and are factored into computer analysis techniques.

A major portion of Reactor Technology work in FY 1987 will involve production of prototype components for the Advanced Fleet Reactor. This reactor will provide higher power and improved performance for the Navy's new design attack submarine.

During FY 1987 Reactor Technology work will concentrate on the Advanced Fleet Reactor components. Specific work items will include: (1) completion and qualification of component and system designs and fabrication of prototype components; (2) completion of final design of the Avanced Fleet Reactor prototype core instrumentation, reactor vessel and closure assembly and associated reactor equipment; (3) component and system testing, with a test of a full size core module; (4) hydraulic analyses and thermal performance calculations for the prototype core; (5) continued fabrication of full-size reactor components for the integrated reactor assembly test loops; and (6) testing of the prototype reactor design. Other Reactor Technology work will include: ongoing research into thermal hydraulic processes, plant optimization analyses, thermal conductivity of various alloys, mechanical properties of reactor components; and new analysis techniques.

e. Reactor Process Development

Reactor Process Development efforts builds developmental cores and fuel cells, and improves and implements processes for the manufacture of naval nuclear reactor fuel, cores, and reactor components.

To realize the performance gains promised by advanced reactor designs, Naval Reactors is developing and refining manufacturing techniques and processes to accommodate the stringent material and design specifications for advanced core and reactor components, while retaining viability for large-scale production. Advanced welding techniques which produce higher integrity - a major factor in structural integrity - also are under development.

Naval reactor component and material design specifications are precise, with minute allowable variances. To ensure technology is correctly implemented, Naval Reactors provides technical assistance to vendors. Exacting quality assurance requirements must be met throughout manufacture; the manufacturing techniques and processes used are continuously upgraded and improved to provide greater assurance of conformance to specifications.

Reactor Process Development work culminates in the production of advanced developmental fuel cells and reactor cores. Main efforts in this area in FY 1987 will include: (1) follow of the installation of the Submarine Test Core in a prototype naval reactor plant; (2) the production of the Developmental Materials Core which will prove out new materials and material concepts; (3) development and production of the Advanced Fleet Reactor prototype core; (4) completing the qualification of a second source of supply for naval nuclear fuel material and continuing technical follow of the current source of supply; (5) continuing development and qualification of new and innovative core manufacturing, inspection and process control techniques; and (6) completing development of an advanced fabrication process and initiating qualification of the process on full-size core preassembly structures.

Capital Equipment

Capital equipment requirements for FY 1987 reflect the Program's efforts to maintain and upgrade eight land based prototype nuclear propulsion plants, provide computing resources commensurate with requirements, increase the efficiency of test and examination facilities, and replace aging equipment.

Items of capital equipment required are: (1) quality assurance equipment, including automation and metrification of measuring equipment; (2) process development equipment, such as heat treatment, laser and metal work equipment; (3) laboratory and engineering test equipment including pumps, autoclaves, and specialized test units; (4) analytic, spectro-chemical and corrosion laboratory equipment, such as test units, systems, and analyzers; (5) fabrication and inspection equipment, including hot cell upgrades, manipulators, oscillographs, and miscellaneous replacement equipment; (6) radiation and safety equipment such as survey meters and assay gauges; and (7) safeguards and security equipment such as radio and alarm systems and physical security upgrades. Also, improved and replacement equipment and systems are needed to provide for the analysis and examination of spent fuel assemblies and other components operated in nuclear propulsion plants including: handling, processing, assembly, and storage equipment and various pieces of support equipment.

Specific requirements include new computers to replace aging scientific computers which are becoming unreliable and difficult and expensive to maintain. Computers are essential resources for reactor design and development. Only through the use of advanced computing equipment can complete and thorough analyses of alternative and competing core and component designs be performed, thus maximizing the performance gains obtained from developmental equipment. FY 1987 capital equipment requirements include procuring a scientific mainframe computer for the Knolls Atomic Power Laboratory, as part of a continuing effort to maintain needed laboratory computing capabilities.

Construction

In Fiscal Year 1987, major construction funds are requested for funding of Kesselring Site Facilities Upgrade, project number 87-N-102, and funding of Computation Laboratory Addition, project number 87-N-103.

The Kesselring Site Facilities Upgrade project consists of constructing two buildings and modifying existing facilities and replacing obsolete utilities at the Kesselring Site in West Milton, New York. The project will provide additional facilities to support site activities and to facilitate prototype plant servicings, including radiological work requirements. The project is required to meet the needs generated by the increasing prototype plant overhaul and refueling workload as well as an increased level of training activity.

The Computation Laboratory Addition will provide for the construction of an addition to the existing computer facility at the Bettis Atomic Power Laboratory in West Mifflin, Pennsylvania. The project is required to accommodate the planned installation of needed replacement computer and support equipment and security improvements. The new addition will house the scientific computer currently planned for FY 1988.

General Plant Project funds are required for minor construction, facilities upgrades, and minor plant improvements at Naval Reactors' laboratories and prototype sites. This work will provide for continuity of present and planned operations, contribute to operating efficiencies, enhance prototype servicing capabilities, upgrade security, improve energy conservation, reduce operating costs, and provide facilities to take full advantage of technological advances. Fiscal Year 1987 General Plant Projects are based on current projections of required facilities upgrades and additions, land improvements, building alterations, and include minor facilities expansion or renovation activities needed to support the Program's research and development effort.

II. Plant Development

	FY 1986 Adjusted Appropriation	FY 1987 Request
Operating Expenses	$62,500	$71,000

Plant Development effort improves overall reactor plant performance through developing plant designs, and components and systems to complement the performance gains achieved through advanced reactor designs.

Determination of plant configuration and size is a critical design task prior to initiating component design and development work. Reactor plant arrangement studies provide initial limits and overall size and organization of components and systems. Resultant system and component designs are tested in full scale mockups to determine conformance to design limitations.

A number of factors bear on plant performance. Improvements in these factors will enhance performance and ensure safe and reliable plant operation. Pressurized water reactors, as the name implies, rely on water to transfer thermal energy. Unfortunately, water also causes corrosion, as does radiation. The effect of these corrosive agents limits component performance over the long term leading to operational restrictions, and costly overhauls and equipment replacement. Besides work directly related to improving water chemistry and reducing radiation effects, effort is devoted to improving material to withstand corrosion, reduce weight and enhance heat transfer features. Work is also directed to new plant concepts, and methods to decontaminate plants.

Instrumentation is also a factor in determining plant operating parameters and, thus, is a factor in overall plant performance. The rapid advances in electronics need to be incorporated into plant instrumentation to allow quicker plant reaction through more responsive instrumentation, higher plant power due to reduced instrumentation variables, and greater reliability because of simplified electronic components. Electronic advances will also allow reductions in weight and space requirements for instrumentation, always a consideration in a naval plant.

Plant improvements would be meaningless without the personnel to operate them. A major factor for nuclear plant operation, therefore, is radiation exposure control. Naval Reactors has been very successful at minimizing personnel radiation exposure and intends to maintain this performance. Toward this end, Naval Reactors develops, implements and evaluates radiation monitoring and control techniques.

attributable to strict enforcement of established controls, extensive monitoring programs, and continuing development of more effective procedures and techniques. In Fiscal Year 1987, work in this area will include: (1) continuing to evaluate radiochemistry methods to identify and understand the cause of unexpected trends and to propose solutions; (2) continuing qualification and training of radiological control technicians to ensure proper conduct of periodic audits and surveys; (3) performing and evaluating environmental monitoring programs; (4) continued dismantling and removal of inactive irradiated facilities; and (5) continuing waste management activities.

b. Plant Technology

Plant Technology work improves the capabilities of propulsion plant systems through development of primary plant fluid, mechanical, and electrical systems and reactor plant instrumentation and control systems. The results of these efforts are manifested in reduced maintenance requirements, increased system reliability, simplified operating procedures, improved plant efficiency, and optimal reactor compartment space utilization.

Plant component and system design work is a complex, iterative process. Fleet and prototype operating experience, material and chemistry development results, reactor plant power, noise and vibration design specifications, and reactor compartment space and weight limitations must be factored into new component and system designs. Integration of individual components into larger systems requires concurrent design analyses of each component. Detailed analytic models are used to emulate component and system performance under normal and abnormal plant conditions, and form the basis for design modifications. Partial and full mockups of resultant designs are installed in test loops and specialized testing facilities, and their performance evaluated against design specifications. Test components are then fabricated and installed in prototypes and periodically inspected to evaluate their in-service performance. To ensure these inspections are accurate, safe and reliable, plant technology work includes development and implementation of improved inspection techniques for in-service and developmental components.

In Fiscal Year 1987, system and component design work will include: (1) evaluating steam generator thermal, hydraulic and mechanical performance through laboratory testing, and plant monitoring and analysis; (2) conducting flow tests on components in test loops under simulated reactor conditions to resolve problems encountered in prototype and other operating reactors, confirm adequacy of new designs, such as tests on Advanced Fleet Reactor components in the Hot Quiet Test Facility, and develop improvements for existing designs; (3) developing and testing innovative steam generator designs; and (4) carrying out design analysis for prototype reactor plant and off hull systems and revising design manuals and test procedures.

The assurance of safe and reliable plant operation requires accurate and consistent reporting of plant conditions and effective means of controlling those conditions. Plant Technology work includes research, development and design of electrical components and instrumentation and control systems capable of providing that assurance. Advances in the fields of electronics and microprocessor technology provide opportunities for more effective, simpler, and reliable instrumentation and control equipment designs.

Advanced instrumentation and control equipment work during Fiscal Year 1987 will include: (1) designing and testing advanced instrumentation and control equipment such as that for the Advanced Fleet Reactor and testing the new equipment in prototype plants; (2) developing new technology and investigating alternate technologies to be used in advanced designs of instrumentation and control equipment; and (3) preparing design manual updates to reflect new system configurations.

Other Plant Technology work in Fiscal Year 1987 includes performing reactor plant protection analyses to assure that equipment and procedures result in acceptable operating plant conditions and safety analysis to ensure that necessary margins are maintained during prototype testing. Additionally, effort will continue to develop, test, and qualify plant emulation procedures and techniques.

III. Reactor Operation and Evaluation

	FY 1986 Adjusted Appropriation	FY 1987 Request
Operating Expenses	$139,000	$173,000

Reactor Operation and Evaluation involves the operation and service of eight land-based prototype naval nuclear propulsion plants used to test new cores, components, and systems, and also used to train Navy personnel as reactor plant operators. New equipment is subject to a number of tests during development, but final design confirmation is only possible through operation in a prototype plant. Special instrumentation in the prototype plants provides data for evaluation of the new equipment and to improve the precision of design methods. Use of the prototype plants allows several years of operating experience prior to fleet application. To the extent possible, equipment continues to operate in the prototype plant after fleet introduction to uncover any problems before they are encountered in the fleet.

A heavy schedule of prototype plant overhauls and refuelings started in FY 1984 and will continue into the early 1990's. During the remainder of the period, major servicing work will be carried out on seven plants. In addition to inserting new test cores and components, existing test units will be checked, and plants will be overhauled. The planned overhauls are more extensive than those previously conducted due to the increasing age of the plants, which now average 25 years. Experience gained and methods used in these overhauls will be directly applicable to the fleet plants whose average age is also increasing.

Reactor Operation and Evaluation is broken down into three categories: (a) Reactor Servicing and Refueling; (b) Reactor Engineering and Analysis; and (c) Reactor Operation and Testing.

a. Reactor Servicing and Refueling

Reactor Servicing and Refueling encompasses the performance of major prototype servicing operations, including reactor plant refuelings, overhauls, component examination, and component removal and replacement. Ensuring all servicing and refueling activities are accomplished safely and efficiently requires the design and development of specialized equipment and procedures. This effort includes: design, development, and fabrication of refueling systems and equipment; and design and implementation of actual refueling and servicing procedures and techniques. Equipment and procedures proven out on the prototype plants are then used for similar fleet servicing activities.

Prototype refuelings and overhauls are scheduled and planned far in advance of the actual servicing operations. However, the complete scope of work cannot be determined until the plant is opened and servicing work has begun. Personnel are trained in all aspects of prototype servicing to accommodate emergent servicing requirements. Continued strong emphasis on thorough overhauls and maintenance is essential to ensure the prototype plants operate safely throughout their planned lifetimes.

Other work under Reactor Servicing and Refueling includes design, analysis, and testing of shipping containers for the disposal of components and cores removed during servicing activities. These containers transport irradiated material from the prototype site to examination and disposal facilities.

In FY 1987, Reactor Servicing and Refueling work will include: (1) performance of the S3G refueling and overhaul; (2) preparation for refueling and overhaul of the MARF prototype; (3) performance of an A1W prototype overhaul; (4) preparation for retirement of the S1W prototype plant; (5) continued preparation and development of reactor servicing procedures, techniques, and equipment; and (6) application of these procedures, techniques, and equipment to fleet servicing activities.

b. Reactor Engineering and Analysis

Reactor Engineering and Analysis consists of evaluating the performance and condition of operating reactor plants and components and comparing actual operating characteristics against design specifications. This effort includes thermal, hydraulic, and mechanical tests, and analyses of cores and reactor equipment to ensure reliable performance. These tests and analyses provide valuable data on how equipment and components perform in actual operating reactor plant environments.

Data obtained from reactor plant operation are analyzed to ensure operation does not violate design limits and to confirm that reactor equipment will last the life of the core. Materials exposed to radioactivity in operating reactor plant environments eventually become susceptible to brittle fracture. This can limit the potential life of a reactor plant. Performance of brittle fracture analysis through ultrasonic and acoustic testing and examination is a means to determine material performance and condition in an operating plant.

Reactor Engineering and Analysis provides important input into the design of new cores and reactor components. Determining the reliability of core and material performance in operating prototype reactors provides information which is used to project the condition of existing fleet operating reactor plants and derive potential design changes for new cores and reactor components.

In Fiscal Year 1987, Reactor Engineering and Analysis work will include: (1) assessment of design reliability and prototype reactor and component performance through thermal, hydraulic, noise, and mechanical analysis and testing; (2) performance of stress, vibration, and brittle fracture analysis to establish reactor operating limits and aid in hardware redesign; (3) development of ultrasonic testing capability; and (4) engineering work to resolve reactor plant hardware concerns and evaluate impact of emergent technology on operating and replacement reactor components.

c. Reactor Operation and Testing

Reactor Operation and Testing provides for the day-to-day operation and routine maintenance of prototype reactor plants which test advanced cores, developmental components, materials, instrumentation, and reactor and propulsion plant systems. This effort also includes the development of inspection programs and procedures for use in reactor plant operating environments. An important function is the training and instruction of personnel to ensure continued safe and reliable operation and maintenance of the prototypes.

Each prototype plant requires quality assurance, radiological control, technical services, and crafts effort to ensure safe and efficient operation and maintenance. Routine maintenance and minor servicing require detailed planning and scheduling of plant operations. Additionally, Navy personnel are given hands-on experience with operating reactor plants to prepare for fleet assignments as reactor plant operators.

Testing performed at the prototypes is carefully monitored to obtain information for new core, component, instrumentation, and propulsion plant system design and development. Data obtained from these tests are also used to resolve emergent design and technical problems experienced during reactor plant operation.

For FY 1987, Reactor Operation and Testing work will include continuing: (1) operation of reactor plants not shut down for servicing; (2) routine preventive and corrective maintenance on the prototype reactor plants; (3) testing of developmental cores, components, and systems to provide data for application to fleet reactor plants; (4) upgrading spare parts management systems; and (5) training of reactor plant operators.

Program Direction

	FY 1986 Adjusted Appropriation	FY 1987 Request
Operating Expenses	$10,923	$11,800

Program direction provides for salaries, benefits, travel, and other expenses for 213 full time Federal employees at the Naval Reactors, Pittsburgh Naval Reactors, and Schenectady Naval Reactors Offices in support of the Naval Reactors Development and Water Cooled Breeder programs.

Naval Reactors could use more personnel, but due to current constraints sufficient high quality personnel cannot be hired. A further concern, and in some respects a more serious one, is the increasing difficulty in retaining personnel. Through careful management and the dedication of existing employees these concerns are not urgent near term problems, but over the longer term will have an adverse effect upon the Program.

Naval Nuclear Propulsion Program personnel are responsible for the reactor plants powering 40% of the Navy's combatants. This requires overseeing and setting policies and procedures affecting numerous organizations including shipyards, operating ships, and contractors. Program personnel also are directly involved in testing, inspecting, and qualifying operating plants and personnel to ensure the high standards of the program are maintained.

Augmenting this support is the development of improved nuclear propulsion plants incorporating the latest advances in reactor technology, fuels, materials, and manufacturing techniques. These plants are used in the Navy's latest nuclear powered warships. Another program supported by Naval Reactors personnel is the Water Cooled Breeder program, which is evaluating the Light Water Breeder Reactor performance. The Light Water Breeder Reactor was the only water cooled breeder reactor ever operated in the United States to supply commercial electric power.

Naval Reactors' personnel maintain close program management and technical direction of the Bettis and Knolls Atomic Power Laboratories and associated facilities, with a combined employment of about 6,800. These laboratories are Government-owned, contractor-operated facilities solely devoted to the Naval Nuclear Propulsion Program.

The Naval Reactors manning level requested for Fiscal Year 1987 is needed to support ongoing programs. Despite increasing workloads there is no change in existing staffing for the reason noted above. Naval Reactors continues to operate with austere staffing.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT OVERVIEW
NAVAL REACTORS DEVELOPMENT
(in thousands of dollars)

Project Number	Project Title	TEC	FY 1986 Adjusted Appropriation	FY 1987 Request
87-N-101	General Plant Projects	$ 4,800	$ 0	$ 4,800
87-N-102	Kesselring Site Facilities Upgrade	$ 13,400	$ 0	$ 5,000
87-N-103	Computation Laboratory Addition	$ 2,300	$ 0	$ 2,300
86-N-101	General Plant Projects	$ 3,770	$ 3,770	$ 0
82-N-111	Materials Facility	$176,000	$11,000	$ 0
81-T-112	Modifications and Additions to Prototype Facilities	$137,000	$27,000	$ 0
86-N-104	Reactor Modifications: Advanced Test Reactor	$ 4,500	$ 4,500	$ 0
TOTAL			$46,270	$ 12,100

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Naval Reactors Development

(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: General Plant Projects
Various

2. Project No. 87-N-101

3. Date A-E work initiated: 1st Qtr. - FY 1987

5. Previous Cost Estimate:
None
Date: N/A

3a. Date physical construction starts: 2nd Qtr. - FY 1987

6. Current Cost Estimate:
$4,800
Date: January 1986

4. Date construction ends: 3rd Qtr. - FY 1988

7. Financial schedule

		COSTS			
Fiscal Years	Obligations	FY 1985	FY 1986	FY 1987	After FY 1987
Prior Years	$ 000	$4,700	$3,700	$ 700	$ 000
1985	2,000	200	1,600	200	000
1986	4,000	000	1,500	2,200	300
1986 Amount Sequestered	(230)	000	000	000	(230)
1987	4,800	000	000	1,900	2,900
		$4,900	$6,800	$5,000	$ 2,970

8. Brief physical description of project

This project provides for minor plant improvements, alterations, additions, and new construction at Naval Reactors' laboratories. In general, these projects consist of land improvements, building alterations, utility improvements, additions to existing facilities, and upgrading present facilities. The work contemplated under this project will provide continuity of present and planned operations, contribute to operating efficiencies, increase safeguards and security capabilities, enhance prototype servicing capabilities, improve energy conservation, reduce maintenance and operating

1. Title and location of project: General Plant Projects
Various

2. Project No. 87-N-101

costs, and provide facilities to take full advantage of technological advances.
The estimate is based on projected requirements for the individual operations offices, as follow:

Pittsburgh Naval Reactors Office	$1,700,000
Schenectady Naval Reactors Office	$3,100,000

9. Purpose, justification of need for, and scope of project

The estimate for FY 1987 general plant projects is based on projected requirements for new plant and other facilities which are coming into operation, and certain special non-recurring projects, which, because of their nature, fall within the criteria for general plant projects. FY 1987 general plant projects will primarily support further enhancements of safeguards and security, and current prototype servicing schedules.

Work under general plant projects will include modifications or betterments to existing buildings and other facilities; safeguard and security upgrades; additions to buildings to house new equipment or personnel; construction of prototype servicing facilities; replacement or additions to roads and utility lines; and general area improvements and development programs to provide for safe and economic operation.

Listed below are examples of proposed subprojects:

a. Central Alarm Station Relocations $ 500,000

This work will provide for the relocation of the central alarm stations at Naval Reactors Kesselring and Windsor Sites. The central alarm stations house all safeguards alarms and communications controls for the security guards at the Kesselring and Windsor Sites. Both stations are currently located along the protected area perimeter fenceline and are considered vulnerable to attack. This project will relocate the stations to areas inside the perimeter fenceline and include modifications to enhance protection capabilities.

b. Radioactive Materials Laboratory Exhaust System Upgrade $ 400,000

This project will provide for the relocation and replacement of portions of the ventilation system for the Radioactive Materials Laboratory facility at the Knolls Atomic Power Laboratory. The Radioactive Materials Laboratory performs tests and examinations on radioactive and contaminated fuel specimens and structural materials. Currently, the High Efficiency Particulate Air (HEPA) and charcoal filters are housed on the roof of the facility. Relocating and upgrading these filters, housings, and associated piping is required to improve maintenance capabilities and prevent susceptibility to damage from severe weather conditions.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General Plant Projects
Various

2. Project No. 87-N-101

c. ECF M-130 Work Stations $ 700,000

This project will provide a work station to unload expended cores from M-130 shipping containers at Naval Reactors Expended Core Facility in Idaho. The work station is required to increase the rate at which M-130's can be unloaded and processed to support the increasing number of prototype and ship refuelings scheduled into the 1990's. The facility will be capable of processing two shipping containers at one time and will replace portable platforms currently in use. The work station will provide the capablity to perform maintenance on shipping containers as required.

10. Details of cost estimate

Details of cost estimates for this project are not available at this time. Detailed cost estimates for general plant projects are normally made in connection with the request for directive after the need for the work has been established, the job has been scoped, and preliminary engineering completed.

. Method of performance

Design will be by the operating contractor and through negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be through fixed-price contracts and subcontracts awarded on the basis of competitive bids.

12. Funding schedule of project funding and other related funding requirements

Not required.

13. Narrative explanation of total project funding and other related funding requirements.

No narrative required.

14. Incorporation of Fallout Shelters:

Not applicable.

1. Title and location of project: General Plant Projects
Various

2. Project No. 87-N-101

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15. Pollution Prevention, Abatement, and Control:

Not applicable.

16. Evaluation of Flood Hazards:

Not applicable.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Naval Reactors Development
(Tabular Dollars in Thousands. Narrative material in whole dollars)

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1. Title and Location of Projects:

Kesselring Site Facilities Upgrade
Knolls Atomic Power Laboratory, Niskayuna, New York

2. Project No.: 87-N-102

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3. Date A-E work initiated
1st Quarter, FY 1987

3a. Date physical construction starts:
1st Quarter, FY 1988

4. Date construction ends:
2nd Quarter, FY 1990

5. Previous cost estimate:
None

6. Current cost estimate:
$13,400
Date: January 1986

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7. Financial Schedule

Fiscal Year	Authorization	Appropriations	Obligations	Costs
1987	$ 5,000	$ 5,000	$ 5,000	$3,000
1988	$ 8,400	$ 8,400	$ 8,400	$4,500
1989	$ 0	$ 0	$ 0	$4,900
1990	$ 0	$ 0	$ 0	$1,000

8. Brief Physical Description of Work:

The project provides for: construction of two buildings, a controlled industrial building and a support building; modification of existing facilities to support radiological work requirements, training needs and prototype plant servicing; and refurbishment and replacement of obsolescent utilities.

The controlled industrial building will be comparable in features, but smaller than facilities used by shipyards performing similar naval nuclear propulsion plant work. The 15,000 square foot, reinforced concrete and metal building will consist of three primary areas: a 6,000 square foot high bay with a 20 ton bridge crane for work on large components; a 3,000 square foot low bay area for work on small components including a gauge calibration room, chemistry laboratory and waste packaging room; and a 6,000 square foot support area in a two story wing to provide office and locker space, instrumentation room, and mechanical services. A special ventilation system will keep the building at a slightly negative pressure to facilitate control of building conditions. A new support building is required to release space at the

Construction Project Data Sheets

1. Title and Location of Projects:
Kesselring Site Facilities Upgrade
Knolls Atomic Power Laboratory, Niskayuna, NY

2. Project No. 87-N-102

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prototype plants for maintenance use, consolidate and expand training activities so that personnel and equipment can be used more effectively to train additional plant operators, and provide needed offices, laboratories, and other work areas to support Site activities. The building will be a two-story, 28,000 square feet, steel framed, windowless structure approximately 140 feet by 100 feet.

Three 22 year old interconnected, prefabricated buildings with a floor area of 18,400 square feet will be renovated to provide a central facility to house a dispensary, metrology laboratory, dosimetry laboratory, chemistry laboratory, administrative services, and site radiological control services. This renovation will consolidate support activities presently scattered around the Site in buildings not designed for laboratory and support facilities and make this space available for needed storage and staging of materials to be used in the maintenance and overhaul work. The total space now allocated to these support services will increase to reflect the increasing workload.

This project also includes extension of utility lines, improvements such as paving, fencing, walkways, and landscaping, construction of two electrical load centers, and replacement of the present antiquated and inoperable backup heating boilers with new high efficiency boilers.

9. Purpose, Justification of Need for, and Scope of Project:

The Kesselring Site consists of four prototype naval nuclear propulsion plants and supporting facilities used for testing nuclear cores, components, and systems, and for training plant operators. The support facilities now available at the Site are inadequate to handle the substantial increase in materials and people required to accomplish the increase in scheduled prototype plant overhauls and refuelings along with an increased level of training activity. Improved facilities are required to effectively perform work on reactor components and refueling equipment in accordance with Naval Nuclear Propulsion Program requirements. At the present time, the Site has no central radiological work area capable of supporting overhaul and refueling of the prototype reactor plants.

Construction Project Data Sheets

1. Title and Location of Projects:
Kesselring Site Facilities Upgrade
Knolls Atomic Power Laboratory, Niskayuna, NY

2. Project No. 87-N-102

10. Details of Cost Estimate

($ in thousands)

		Item Cost	Total Cost
(a)	Engineering, design and inspection at 14% of construction cost		$ 1,200
(b)	Construction Cost		8,460
	(1) Improvements to land	1,255	
	(2) Buildings	4,715	
	(3) Utilities	1,525	
	(4) Special Facilities	965	
(c)	Standard Equipment		1,920
(d)	Removal Cost, Less Salvage		600
	Subtotal		$12,180
(e)	Contingency @ 10% of above costs		1,220
	Total Estimated Project Cost		$13,400

11. Method of Performance

Design of the controlled industrial building and the support building will be accomplished by negotiated architect-engineer contract. Design of the utilities upgrade and renovation of support spaces will be accomplished in-house. Construction of facilities and procurement of equipment by fixed price contract will be awarded on the basis of competitive bids for all portions of this project.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

	Prior Year	FY 1987	FY 1988	FY 1989	FY 1990	TOTAL
1. Total facility cost						
(a) Construction line item	0	$3,000	$4,500	$4,900	$1,000	$13,400
(b) PE&D	0	0	0	0	0	0
(c) Inventories	0	0	0	0	0	0
Total Facility Cost	0	$3,000	$4,500	$4,900	$1,000	$13,400

1. Title and Location of Projects:
Kesselring Site Facilities Upgrade
Knolls Atomic Power Laboratory, Niskayuna, NY

2. Project No. 87-N-102

2. Other Project Funding

(a) R&D necesary to complete construction	0	0	0	0	0	0
(b) Other project related costs	0	0	0	0	0	0
Total other project funding	0	0	0	0	0	0
Total Project funding	0	$3,000	$4,500	$4,900	$1,000	$13,400

b. Total related funding requirements (estimated life of project 20 years)

1. Facility operating costs	$ 60
2. Programmatic operating expense directly related to facility	160
3. Capital equipment not related to construction but related to the programmatic effort in the facility	80
4. GPP or other construction related to programmatic effort in the facility	0
5. Other costs	0
Total other related annual funding requirements	$300

13. Narrative Explanation of Total Project Funding and Other Related Funding

a. Total Project Funding:
No narrative required

b. Total related funding requirements:

1. Facility Operating Costs:
The primary factor is the additional fuel oil consumption to heat the two new buildings.

2. Programmatic Operating Expenses Directly Related to the Facility:
Operating funds directly related to this facility will be used for acquisition of containments, glove boxes, vacuum cleaners, miscellaneous tooling and furnishings. As these items are consumable, there will be a cycle of replacement.

Construction Project Data Sheets

1. Title and Location of Projects:
Kesselring Site Facilities Upgrade
Knolls Atomic Power Laboratory, Niskayuna, NY

2. Project No. 87-N-102

3. GPP or other construction related to programmatic effort:
No narrative required.

4. Other costs:
No narrative required.

14. Incorporation of Fallout Shelters

The support building and the renovated support spaces are not suitable as Fallout Shelters due to the type of pre-engineered construction which does not provide for below ground excavation. The controlled industrial building is not suitable for use as a fallout shelter because of the radiological repair work planned for accomplishment in the facility.

15. Pollution Prevention, Abatement and Control

The total estimated cost includes those measures to comply with Presidential Executive Order 12088. Waterborne effluents will consist of sanitary waste and processed discharge waste that will be discharged to the existing sewage treatment plant. Airborne effluents will be limited to air exhausted by the ventilation system or special ventilation with an environmental stack permit.

16. Evaluation of Flood Hazards

This project is located in an area not subject to flooding, determined in accordance with Executive Order 11988.

17. Environmental Impact

This project will be planned to comply with National Environmental Policy Act, DOE 5440.1B, IMPLEMENTATION OF THE NATIONAL ENVIRONMENTAL POLICY ACT, the Council on Environmental Quality Regulation (40 CFR 1500-1508), DOE's NEPA guidelines (45 FR 20694, as amended), DOE's regulation 10 CFR 1022, and other related applicable statutes. The proposed building is not located in a floodplain/wetland.

1. Title and Location of Projects:
Kesselring Site Facilities Upgrade
Knolls Atomic Power Laboratory, Niskayuna, NY

2. Project No. 87-N-102

18. Accessibility for the Handicapped

This project will not be designed to provide accessibility to the handicapped in accordance with the Architectural Barriers Act (Public Law 90-480) and the Federal Property Management Regulations (41 CFR 101-91.6). This project need not, because of its intended use, be made accessible to, or usable by, the public or by severely, physically handicapped persons.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Naval Reactors Development

(Tabular dollars in thousands. Narrative material in whole dollars)

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1. Title and Location of Project:

Computation Laboratory Addition
Bettis Atomic Power Laboratory, Pennsylvania

2. Project No. 87-N-103

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3. Date A-E work initiated:
1st Quarter FY 1987

3a. Date physical construction starts:
4th Quarter FY 1987

4. Date construction ends:
4th Quarter FY 1988

5. Previous cost estimate:
None

6. Current cost estimate:
$2,300
Date: January 1986

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7. Financial Schedule:

Fiscal Year	Authorization	Appropriation	Obligations	Costs
1987	$2,300	$2,300	$2,300	$ 650
1988	$ 0	$ 0	$ 0	$1,650

8. Brief Physical Description of Project

This project provides for the construction of a two story addition to an existing building to house the expanding Computation Laboratory. The addition to the building currently containing the Computation Laboratory will accommodate the installation of needed new computer and support equipment and improvements in security. The addition will be about 12,000 square feet in size, of masonry construction as is the existing building, and will meet all applicable security requirements. Raised floors will be installed to accommodate rearrangement of existing computer facilities and provide flexibility for optimizing locations of new computer systems. Security improvements will include installing a concrete slab roof on the addition and increasing the height of the site perimeter fence near the new facility.

Existing utility services will be extended to the new addition as part of this work effort and cooling water systems will be upgraded to provide redundant chillers and a cooling tower. This requires installation of several water chillers and

Construction Project Data Sheets

1. Title and location of Project:
Computation Laboratory Addition
Bettis Atomic Power Laboratory, Pennsylvania

2. Project No. 87-N-103

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air handlers, and associated equipment foundations.

9. Purpose, Justification of Need for, and Scope of Project

The purpose of this project is to provide necessary space to accommodate installation of a new computer and required auxiliary and utility systems and to upgrade security. A scientific computer system is currently anticipated for delivery to Bettis in FY 1988.

10. Details of Cost Estimate

($ in thousands)

	Item Cost	Total Cost
a. Engineering, design and inspection at 13% of construction costs		
b. Construction costs		$ 195
(1) Improvements to land including grading, drainage diversion, paving, and fencing		1,450
(2) Buildings	19	
(a) Two story area, 12,000 gross square feet		
(3) Other structures	1,431	
(4) Utilities including electrical power, water, drain lines	0	
(5) Special facilities	0	
c. Standard equipment	0	
d. Removal less salvage		445
		0
Subtotal		$2,090
e. Contingency at 10%		
		210
Total Estimated Cost		$2,300

Construction Project Data Sheets

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1. Title and location of Project:
Computation Laboratory Addition
Bettis Atomic Power Laboratory, Pennsylvania

2. Project No. 87-N-103

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11. Method of Performance

Contracting arrangements are as follows:

a. Design of the building addition will be accomplished via a cost plus fixed fee, sole source design contract. The construction and outfitting of the addition will be accomplished through fixed-price contracts awarded on the basis of competitive bidding.
b. Title III Inspection will be by the operating contractor.

12. and 13. Funding Schedule and Narrative Explanation of Total Project Funding and Other Related Funding Requirements

Items 12 and 13 are not required. This project has a total estimated cost of less than $5 million and does not have significant "other direct project costs" and only minor "other related costs".

14. Incorporation of Fallout Shelters

The building to be constructed as a part of this project is not suitable as a fallout shelter because of the high concentration of electrical power and computer equipment to be installed in this building.

15. Federal Compliance with Pollution Control Standards

As presently conceived, operation of this project will not generate any environmental pollutants; therefore, the requirements of Executive Order 12088 are not applicable.

16. Evaluation of Flood Hazards

This project will be located in an area not subject to flooding determined in accordance with Executive Order 11988.

17. Environmental Impact

This project will be planned to comply with National Environmental Policy Act, DOE 5440.1B, IMPLEMENTATION OF THE NATIONAL ENVIRONMENTAL POLICY ACT, the Council on Environmental Quality Regulation (40 CFR 1500-1508), DOE's NEPA guidelines (45 FR 20694, as amended), DOE's regulation 10 CFR 1022, and other related applicable statutes. The proposed building is not located in a floodplain/wetland.

Construction Project Data Sheets

1. Title and location of Project:
Computation Laboratory Addition
Bettis Atomic Power Laboratory, Pennsylvania

2. Project No. 87-N-103

18. Accessibility for the Handicapped

This project will not be designed to provide accessibility to the handicapped in accordance with the Architectural Barriers Act (Public Law 90-480) and the Federal Property Management Regulations (41 CFR 101-91.6). This project need not, because of its intended use, be made accessible to, or usable by, the public or by severely, physically handicapped persons.